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AUTUMN 1985

FUEL LINE

DEFENSE FUEL SUPPLY CENTER **ALEXANDRIA, VIRGINIA**

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Inside This Issue:

DFSC's Pipeline Customers

DEFENSE FUEL SUPPLY CENTER

FUEL LINE *is an official publication, prepared quarterly by and for the Defense Fuel Supply Center and fuel-oriented clientele.* FUEL LINE *is designed to provide timely, factual information on policies, plans, operations, and technical developments of the center, and interrelated subject matter. Views and opinions expressed in* FUEL LINE *are not necessarily those of the Department of Defense.*

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AUTUMN 1985

1985 Defense Energy Management Plan 2
The 1985 DEMP was published in September. This extract discusses current Defense Department energy needs and initiatives that will ensure we remain energy secure.

First Maritime Pre-Positioning Ship Squadron Deployed 12
DFSC is providing the fuel for 13 MP ships. The program will increase the responsiveness of Marine Corps forces when rapid deployment is required.

Coal Outlook 1985 13
This article is adapted from a presentation given at the Annual Coal Outlook and discusses requirements of the DFSC coal program.

DFSP Rodman Sells Leftover Fuel Oil 14
Thanks to a negotiated sale with the Panama Canal Commission, DFSP Rodman employees were able to move 210,000 barrels of NSFO.

TEST YOUR KNOWLEDGE: Do You Know Your Codes? 18
The DFSC safety and health officer has developed this test to gauge your savvy.

Update on the Strategic Defense Initiative 19
Since March 1983, when the president challenged scientists to develop SDI, there have been considerable advances in critical research areas.

What's in a Barrel of Oil? 20
It all depends on demand, of course, but this article discusses the average product yield.

Where Can We Go With Synthetic Fuels? 21
This article is based on a presentation given before the National Council on Synthetic Fuels on October 14, 1985. It discusses what the synfuels industry has provided the Defense Department with in the past and what it may give in the future.

Pipelines: A Direct Supply Link for Many DFSC Customers 24
1985 was a very good year for pipeline connections. This article discusses the evolution of the industry from World War II, and how DFSC customers are reaping the benefits of this unique transportation mode.

Military Pipelines 28
The modern version started with the Big Inch, Little Inch, and Pluto during World War II.

Technical Directorate Hosts Annual Technical Meeting 33
A total of 35 representatives of Defense Department fuel organizations attended the meeting to discuss technical problems and advances.

Commander's Corner

Those of you who are organizational chart watchers will notice a name change for one of DFSC's most important Directorates. As part of the Defense Logistics Agency's quest for quality, Lieutenant General Donald M. Babers, USA, Director, DLA, has asked each of his subordinate Commanders to establish a Quality Assurance Directorate.

DFSC has long had a Quality Division in our Technical Operations Directorate. We now have formed the Quality Assurance and Technical Operations Directorate which will have increased manning and an even greater emphasis on Quality. We are in the process of developing a standardization-evaluation program to ensure uniform, high quality testing and measurement of petroleum products, as well as bringing a full-time quality circle coordinator on board. We are dedicated to quality in all that we do--quality products--industrial quality--daily work quality--and quality service to the Armed Forces and the other petroleum consumers we serve.

The Quality effort will pay dividends for all of us. Please join us.

John E. Griffith
JOHN E. GRIFFITH
Brigadier General, USAF

1985 Defense Energy Management Plan

This article is excerpted from the 1985 Defense Energy Management Plan, which is prepared by the Office of the Deputy Assistant Secretary of Defense for Logistics and Materiel Management.

PURPOSE

Energy is a vital ingredient of national security, and an adequate and secure supply is necessary to maintain our peacetime readiness and to meet our worldwide defense commitments. Moreover, our energy resources must be used in ways that advance national goals and policies. The Defense Energy Management Plan (DEMP) addresses these needs within the Department of Defense (DOD).

The DEMP documents planning undertaken by the deputy assistant secretary of defense for logistics and materiel management within the Office of the Assistant Secretary of Defense (Acquisition and Logistics) [OASD (A&L)]. It supplements and interprets other energy policy documents and reports the accomplishments of recent programs and plans for future activity.

The DEMP also meets reporting requirements established by the Energy Policy and Conservation Act (EPCA), the National Energy Conservation Policy Act (NECPA), and Executive Order 12003. It discusses changes in policy, presents current energy data, and reports on progress toward goals.

DEFENSE ENERGY CONSUMPTION

The federal government accounts for 2.5 percent of the nation's energy consumption. DOD is the largest energy consumer within the government, responsible for 82 percent of federal government energy consumption.

In fiscal year (FY) 1984, DOD consumed 1.5 quadrillion British thermal units (Btu), equal to 263 million barrels of oil equivalent (BOE). This does not take into account the energy consumed by the industries supporting DOD nor the energy generated and consumed by nuclear-powered ships and submarines.

> "Because of falling prices, energy cost is not the budgetary concern it was just a few years ago. This trend is clear from the relation of DOD energy spending to its relative outlays for operations and maintenance, and to its total outlays."

Petroleum and purchased electricity together account for almost nine-tenths of the energy consumed by DOD, with petroleum alone representing more than two-thirds. Jet fuel accounts for two-thirds of that consumption. The next largest portion consists of diesel and other distillate fuels. With the exception of a slight increase in electricity and decrease in petroleum, the relative proportions of the general fuel types have remained quite stable within the fluctuations of overall fuel consumption. However, the relative use of jet fuel and the diesel-distillate category has grown while the relative proportion of fuel oil has declined.

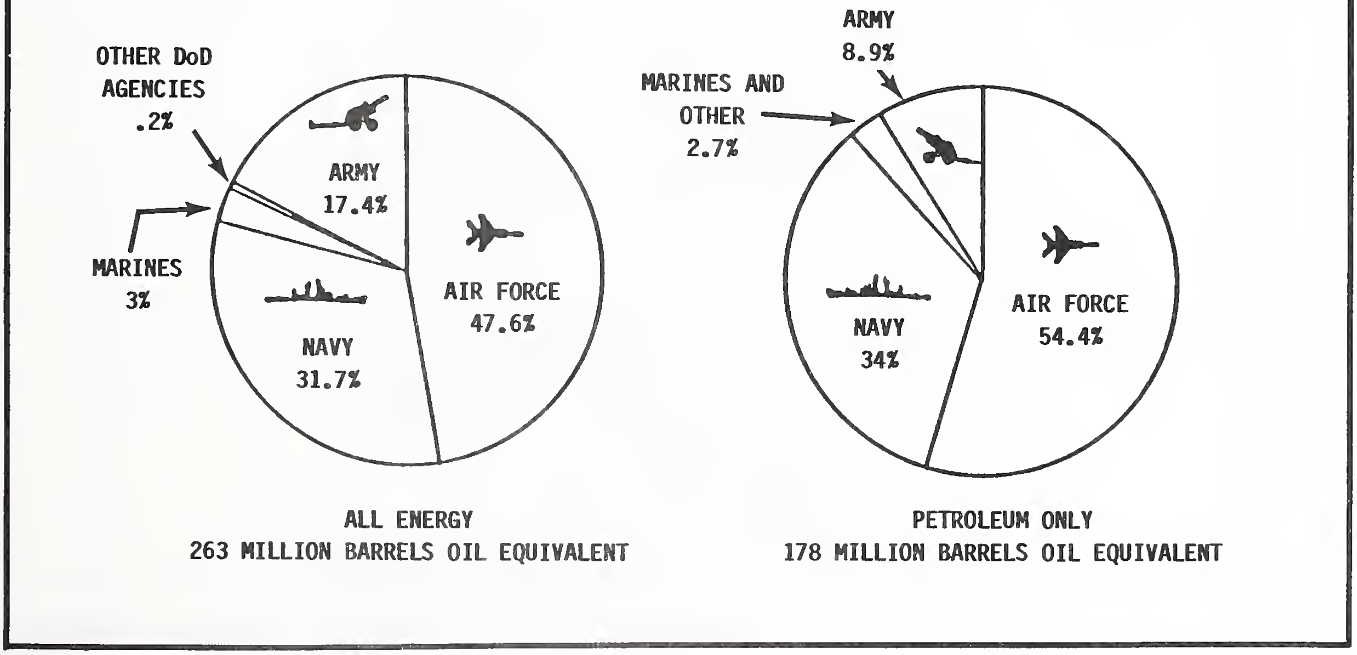
The Air Force, with slightly less than half of total consumption and more than half of petroleum consumption, is the largest consumer within DOD. The second largest consumer is the Navy with 31.7 percent of total energy and 34 percent of petroleum consumption. The Army used 17.4 percent of energy and 8.9 percent of the petroleum products. These proportions have changed little in the last decade.

Of total energy consumed, 65 percent was in the continental United States (CONUS); the 35 percent of overseas usage includes fuel consumed by Naval vessels at sea. Overseas consumption percentages by fuel types are petroleum: 42.6; electricity: 20.3; natural gas: 5.5; and other: 36.2. Overseas consumption percentages by DOD component are: Army: 29.0; Air Force: 25.2; Navy: 54.7; Marine Corps: 21.5; and other: 6.7.

Aircraft are the largest users of both petroleum and total energy. Ground vehicles consume a relatively small portion, 9.4 percent of petroleum and 6.3 percent of all energy. Ship operations and facilities fall into the midrange of end use, although facilities' total energy consumption almost equals that of aircraft.

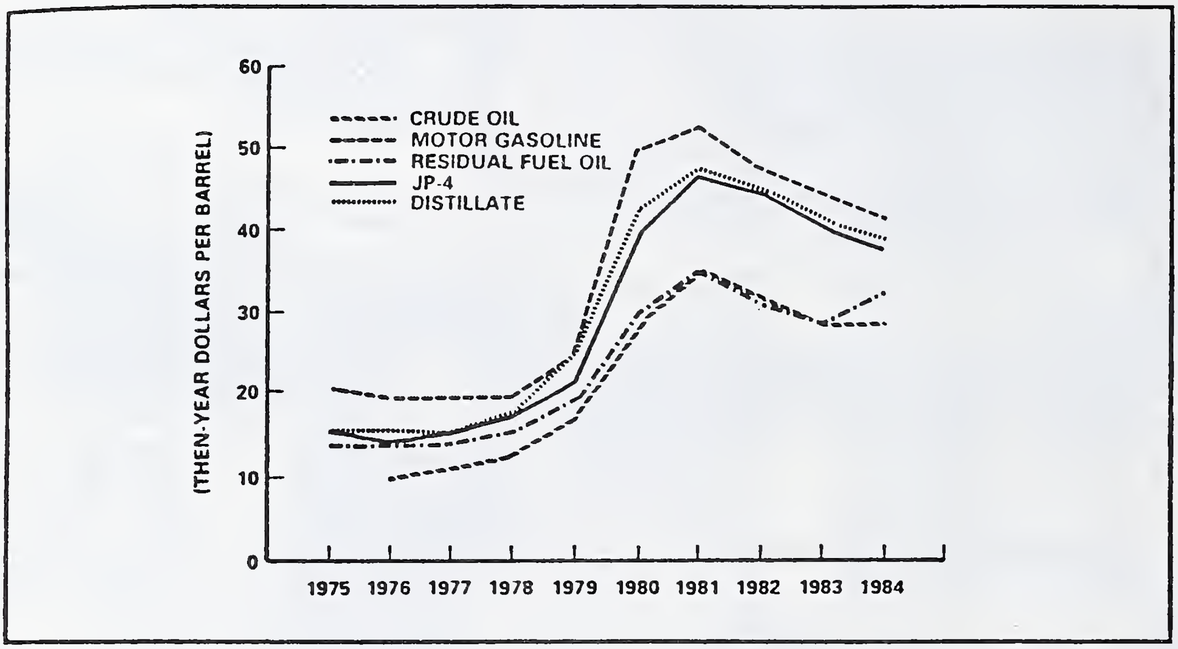
DEFENSE ENERGY COSTS

The cost of DOD energy con-

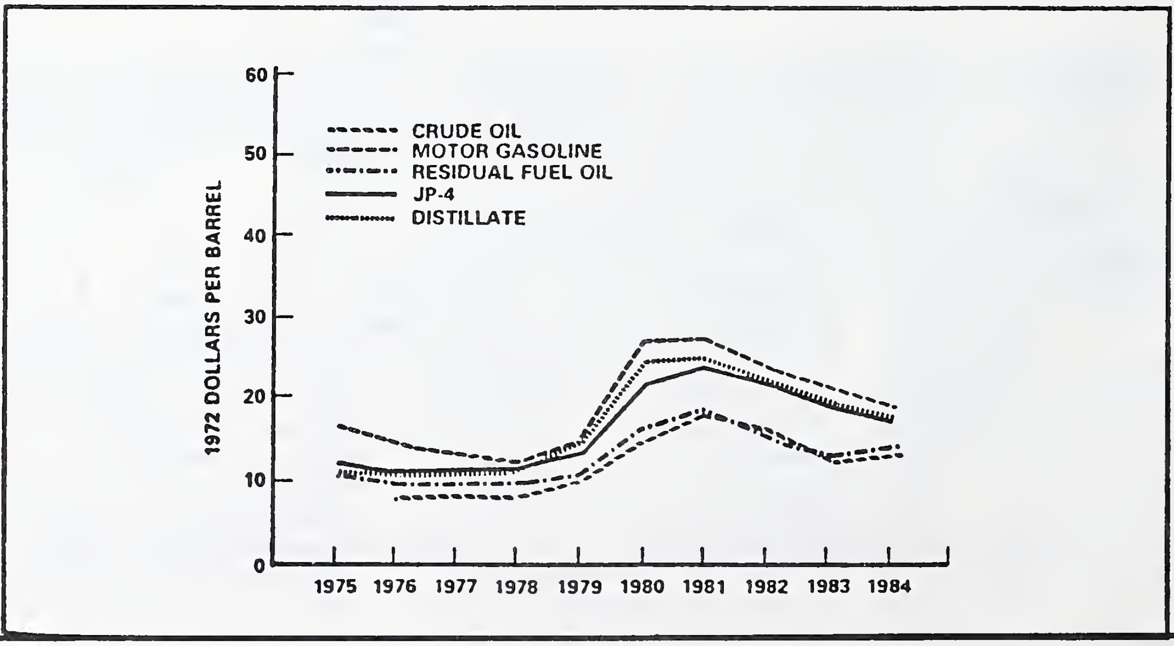


UNIT PRICES FOR CRUDE OIL AND DOD PRODUCTS

(1) IN THEN-YEAR DOLLARS



(2) IN CONSTANT 1972 DOLLARS



sumption in FY 1984 was approximately $9.6 billion.[1] Petroleum use accounts for a relatively large share of both total energy cost (almost three-fourths) and total energy consumption (slightly over two-thirds).

Energy costs have declined in recent years. Figure 1 compares the prices for crude oil and four major bulk petroleum products managed by DFSC in then-year dollars. Figure 2 makes the same comparison for prices in constant dollars. Figure 1 shows that then-year dollar prices peaked in 1981 and have generally been dropping since. Figure 2 shows that the drop in real prices is more dramatic. The price trend is also reflected in the total cost of petroleum products purchased by DFSC, since the quantities were relatively constant (figure 3).

Because of falling prices, energy cost is not the budgetary concern it was just a few years ago. This trend is clear from the relation of DOD energy spending to its outlays for operations and maintenance (O&M)[2] and to its total outlays. Roughly 20 percent of DOD O&M outlays went to energy in FY 1981; by FY 1984, the figure fell by almost one-third to 14 percent. Similarly, energy spending accounted for 5 percent of DOD's total outlays in FY 1981 but only 4.4 percent of total outlays in FY 1984.

The goal of DOD energy policy is to enhance the preparedness and efficiency of energy systems and activities to meet worldwide military and industrial base requirements at the lowest possible cost. Energy Programs (EP), in the Office of the Assistant Secretary of Defense (Acquisition and Logistics), has established management priorities to guide DOD components toward this goal. These priorities—and the various energy programs that fall under them—are stated each year in the first Defense Energy Policy Program Memorandum (DEPPM) for that year.

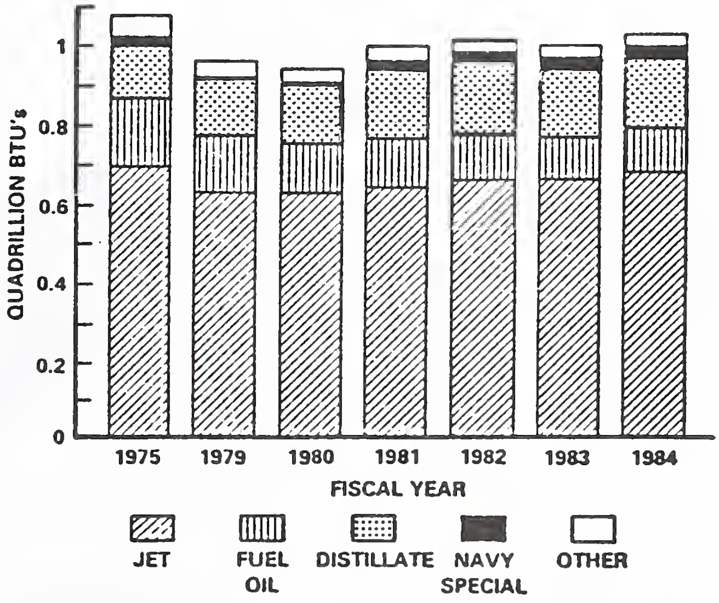
ENERGY PREPAREDNESS

The first DOD energy management objective is energy preparedness. This objective is being met by initiatives in three areas: petroleum logistics, supply assurance, and operations support. Petroleum logistics programs are directed toward strengthening DOD's oil storage and transportation infrastructure and increasing its ability to make use of commercial facilities and fuels. The supply assurance program is intended to reduce DOD vulnerability to energy supply disruptions. Operations support programs are aimed at improving DOD management of utility energy and strengthening DOD initiatives for exploiting alternative fuels.

This chapter restates the DEPPM 85-1 energy preparedness programs

3

RECENT DOD FUEL USAGE



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[1] This section presents DOD energy costs estimated from Defense Energy Information System consumption data and unit price data obtained from the Military Departments and the Defense Logistics Agency (DLA). Bulk fuel costs reflect the fuel prices incurred during FY 1984 by DFSC, not standard DFSC prices.

[2] Most energy expenditures fall within the O&M appropriations category. Slightly more than 1 percent of fuel costs fall under each of the research, development, test, and evaluation and family housing appropriations.

and compares them with the goals established by previous DEPPMs or stated in previous DEMPs. It also describes recent DOD accomplishments and outlines how DOD plans to make further progress.

PETROLEUM LOGISTICS

Programs in petroleum logistics are intended to increase DOD's ability to supply U.S. forces with oil. DOD components seek this objective through initiatives that will strengthen DOD's oil storage and transportation infrastructure and that will increase DOD's ability to make use of commercial facilities and fuels.

STORAGE AND TRANSPORTATION

DOD purchases most of its oil (i.e., 62 percent) from refineries in CONUS. Once oil is acquired, it is transported to using commands by tankers, pipelines, or other means. Oil products used by U.S. forces in the North Atlantic Treaty Organization (NATO) are purchased from European refineries or in some cases are transported from U.S. refineries. Oil products used by units in the Pacific and Indian Ocean also come from refineries located on both U.S. and foreign soil.

PROGRAM

(Storage and Distribution Enhancement)

Improve DOD's ability to sustain U.S. forces during a contingency within resource limits.

RELATION TO PREVIOUS GOALS

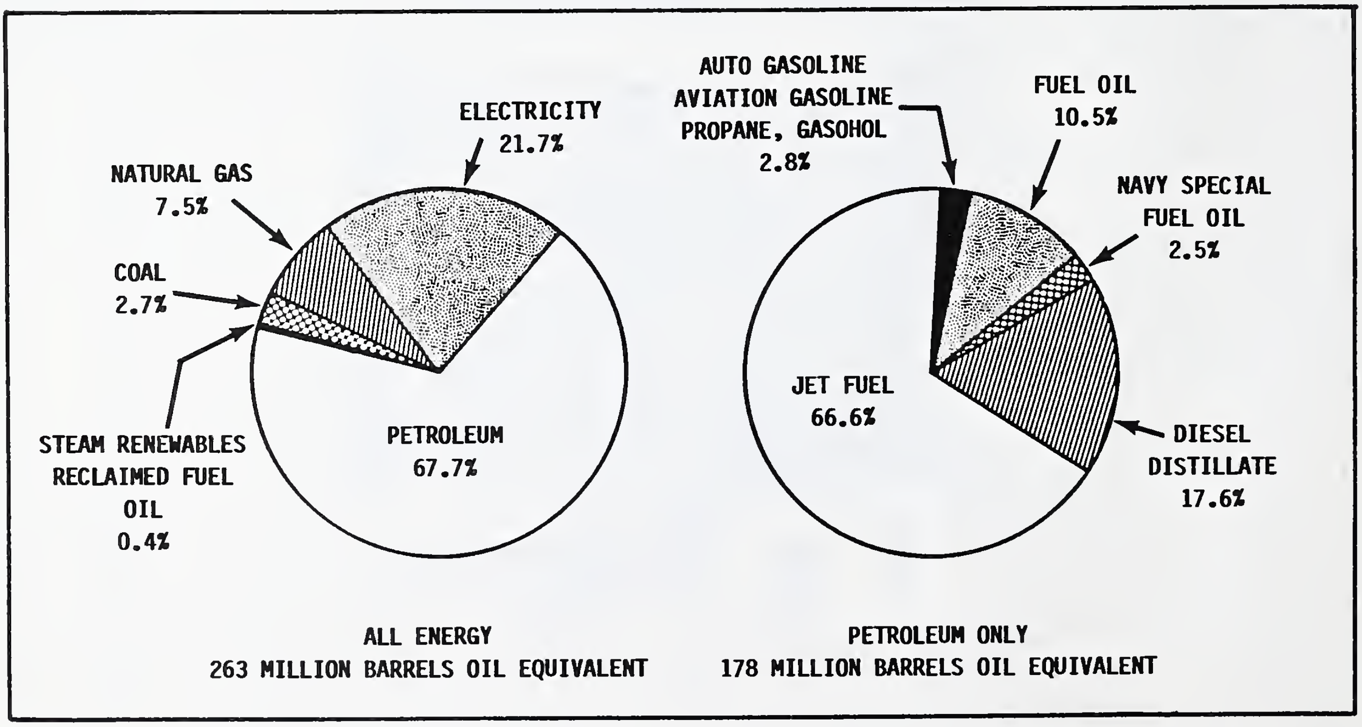
This program represents continuity with the petroleum logistics management priorities established by DEPPMs in recent years.

ACCOMPLISHMENTS

DOD has undertaken a number of initiatives to strengthen its oil transportation and storage infrastructure. Many of those initiatives involve improvements in widespread areas of the world. For example, the Joint Chiefs of Staff has tasked the Defense Intelligence Agency (DIA) to gather data on refining capacity, distribution systems, and bunker fuel storage for Latin America, Africa, and Southwest Aisa. These data will permit DOD to make a more accurate assessment of possible sources of overseas support in crises should the need arise. EP played a major role in a recent study of sealift and storage requirements. Requirements for both kinds of support diminish if DOD can acquire needed fuel from refiners overseas, closer to the area of operations.

The Navy and the Army have been working to improve DOD's ability to move petroleum products from ship to shore in areas that do not have an oil transport infrastructure. Several advances have been made through joint service efforts in the Southwest Asia Petroleum Distribution Operational Project. These advances include Navy-

DOD ENERGY CONSUMPTION BY FUEL TYPE IN FY 1984



directed development of the capability to deliver a single anchor leg mooring system to an undeveloped theater and to lay a flexible armored undersea pipeline from ship to shore. They also include Army-directed development of advanced collapsible fuel storage bags, pumps, couplings, and lightweight aluminum pipe. Taken together, these improvements offer the capability to off-load Military Sealift Command (MSC) tankers even when specialized port facilities are not available.

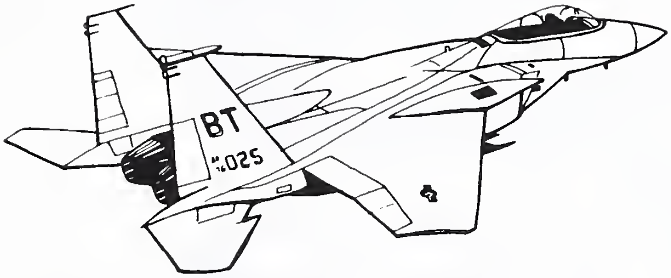
DOD has acted to improve overseas fuel storage in several critical regions. As a result of conversations with EP, U.S. forces in Korea have established closer contacts with Korean government agencies and the Korean petroleum industry. Such contacts mean that U.S. forces, Korean firms, and the Korean government can each make decisions on the basis of greater awareness of the others' plans. Enhanced awareness promises to improve fuel support for both normal operations and military crises.

In addition, DOD has initiated efforts to provide additional fuel storage capacity in Southwest Asia by leasing storage facilities in the region. DOD has begun talks with two countries in the area, but this initiative appears likely to be an extended one.

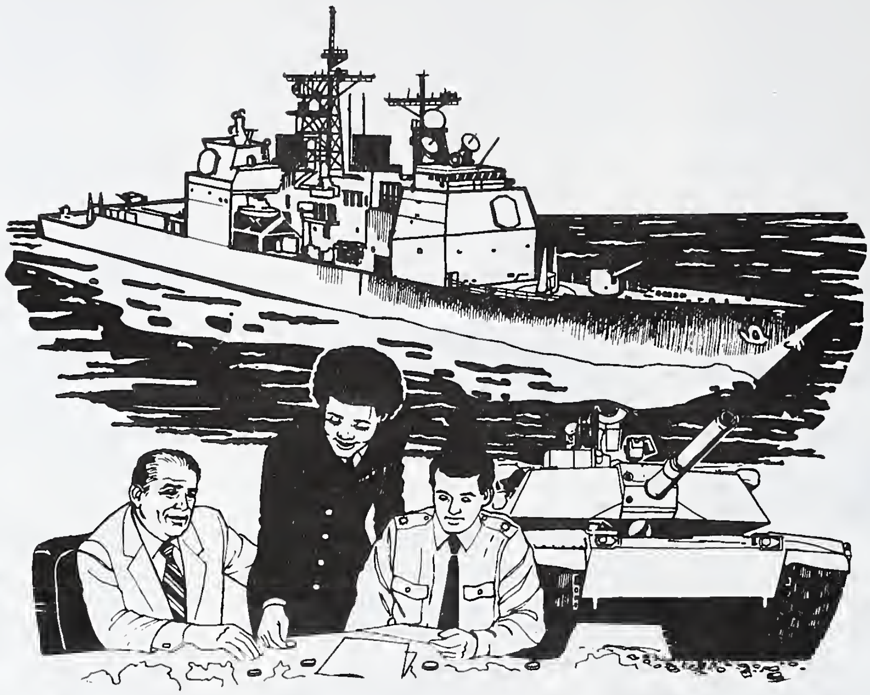
DOD has made substantial progress in overcoming regional storage deficits on NATO's southern flank. In October 1984, DFSC leased additional storage capacity in Turkey and can now meet most of its storage requirements in that country. DOD is continuing its efforts to acquire additional needed storage through host nation support (HNS).

DOD policies regarding NATO's central region reflect an important change. EP is taking a vital leadership role in addressing the region's fuel problems and has abandoned a reactive posture in favor of an active one. This shift is reflected in several initiatives.

Recently, EP asked the Logistics Systems Analysis Office (LSAO) to study petroleum storage and distribution in NATO. In particular, EP was interested in deter-



"The first DOD energy management objective is energy preparedness. This objective is being met by initiatives in three areas: petroleum logistics, supply assurance, and operations support. Petroleum logistics programs are directed toward stengthening DOD's oil storage and transportation infrastructure and increasing its ability to make use of commercial facilities and fuels. The supply assurance program is intended to reduce DOD vulnerability to energy supply disruptions. Operations support programs are aimed at improving DOD management of utility energy and strengthening DOD initiatives for exploiting alternative fuels."



> "DFSC has taken several actions to improve DOD's petroleum logistics posture. For example, it has embarked on a vigorous tankage acquisition program and has adopted new management procedures to reduce fluctuations in the size of DOD stocks. As a result of these initiatives, DFSC has recently achieved the highest inventory levels in its history."

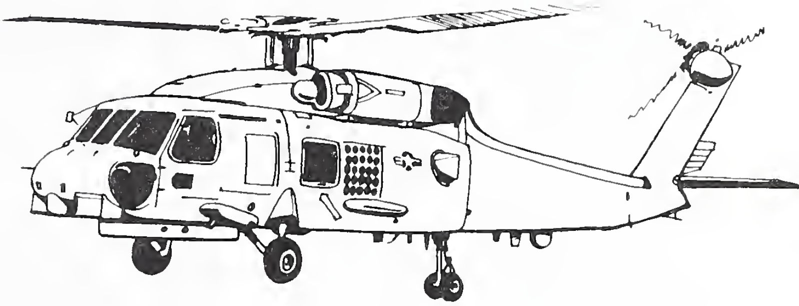
mining whether sufficient NATO funds were being allocated to build transport and storage facilities. LSAO found unanimous agreement among U.S. and NATO commands that petroleum, oils, and lubricants (POL) facilities funding is being fairly treated. LSAO also found that distribution is the principal POL problem in Central Europe, storage facilities there are in the wrong place, and the fuel transport system is not adequate to meet wartime requirements.

EP has taken action to deal with the distribution problems that LSAO identified. In August 1984, for example, EP hosted a NATO Energy Issues Conference to address the major petroleum logistics problems (such as POL distribution) that confront the United States and its allies in Europe. At that meeting, EP recommended a marketing analysis of the potential of the NATO-owned Central European Pipeline System (CEPS) for commercial use. Such use would involve the construction of facilities to connect the CEPS to commercial producers and would enhance its flexibility for wartime use. The conference also addressed the issue of NATO-wide adoption of JP-8 as the standard jet fuel for land-based aircraft. (Accomplishments in the latter area are discussed in the next section, which deals with fuel standardization.)

DFSC has taken several actions to improve DOD's petroleum logistics posture. For example, it has embarked on a vigorous tankage acquisition program and has adopted new management procedures to reduce fluctuations in the size of DOD stocks. As a result of these initiatives, DFSC has recently achieved the highest inventory levels in its history. In addition, DFSC has prepared its second Worldwide Inventory and Storage Plan (WISP). That document analyzes the volume and location of storage needed to support the military services, and specifies over a 5-year planning period the way that DFSC and the services intend to provide such storage. DFSC is also developing a worldwide stock rotation policy.

EP recently coordinated the efforts of MSC and DFSC to improve fuel support for the strategic sealift fleet. (This fleet includes both commercial and MSC tankers and cargo-hauling ships that support U.S. forces overseas. Improvements discussed here involve providing fuel, termed "bunkers," that these ships consume directly, but not the fuel that they merely transport for others to use.) The outgrowth of these organizations' efforts was an agreement between DFSC and MSC regarding the Defense Production Act (DPA) that formalizes the procedures MSC will follow if it encounters difficulty in acquiring fuel.

"EP believes that DOD's weapons systems may be able to use fuel that meets commercial specifications without prohibitive costs in maintainability and performance. If so, these systems are not as intolerant of commercial fuels as was believed in the 1950s and 1960s."



Once DFSC is informed of MSC problems, it will attempt to acquire the fuel that MSC needs. If it cannot do so, it will request invocation of the DPA under which DOD can request that the Energy Department direct particular suppliers (via a "rated order") to provide fuel as needed. (Firms that receive rated orders can in turn direct their suppliers to provide necessary support.) By formalizing procedures to permit use of DPA to support the strategic sealift fleet during a future mobilization, DOD can eliminate delay in such a crisis and cover about 37 percent of its total strategic sealift bunker requirement.

PLANS

EP will guide other actions to strengthen the DOD petroleum logistics posture. For example, EP intends to increase the availability of HNS to provide bunker fuel, especially in Europe. It plans to cover some 28 percent of the strategic sealift bunker requirement in this way.

EP plans to support a second DOD petroleum logistics initiative conceived by DFSC. It involves use of ships in the Ready Reserve Fleet (RRF) as floating storage tanks. The Department of Transportation (DOT) is buying old or excess tankers to place in the RRF, and the Navy has committed $500,000 for each of these ships to prepare them for RRF status. Placement in the RRF need not necessarily imply that a tanker will be filled with fuel and used for floating storage. However, DFSC is willing to pay estimated costs above the $500,000 figure (i.e., some $100,000 to $200,000 apiece) in order to use these ships as floating storage vessels. At this cost to DFSC, use of RRF ships provides storage afloat for a cost dramatically below that of the $5 per barrel annual cost of steel tank storage ashore. (RRF ships can carry 200,000 to 225,000 barrels apiece.)

DOD plans call for two to five tankers to enter the RRF by the end of FY 1985. DFSC proposes storing JP-5 jet fuel in two of these vessels and staging them in the Caribbean region. (Use of JP-5 fuel reduces the risks of fire and explosions. It also provides flexibility since JP-5 can be used both for aircraft and also as a substitute bunker fuel.) Roughly 3 to 5 percent of the DOD total strategic sealift bunker requirement will be covered by use of the initial RRF ships for floating storage.

Eventually DOD will have 16 tankers in the RRF. If the floating storage program proves cost effective, use of RRF ships for floating storage could be expanded.

FUEL STANDARDIZATION

Initiatives to strengthen DOD's oil storage and transportation infrastructure constitute one of EP's petroleum logistic programs. Its other program involves fuel standardization, which will increase DOD's ability to make use of commercial facilities and fuels.

In part, EP's fuel standardization program responds to guidance from the deputy secretary of defense. He has directed the secretaries of the military departments to eliminate non-cost-effective contract requirements. Following that direction, EP is seeking to change the design practices that currently limit weapons support systems to the use of military specification fuels. The revised draft of DOD Directive 4140.43 (discussed later) is intended to help in this effort. In addition, EP is investigating state-of-the-art modifications to military equipment in ways that would increase its tolerance for commercial fuels. Both of these initiatives are part of the fuel standardization program stated in DEPPM 85-1.

> "The draft revision of DOD Directive 4140.43 is intended to strengthen DOD policy on fuel standardization. It stresses the need for equipment to operate on a broadened specification fuel and for equipment to be designed with increased tolerance for a wider variety of commercially available fuel."

PROGRAM

(Fuel Standardization)

Increase availability and sources of products and minimize dependence on military-unique fuel specifications.

RELATION TO PREVIOUS GOALS

For the past several years, EP has accorded a high priority to fuel standardization, which will enhance military preparedness by encouraging links between commercial and military fuel distribution systems and by enabling the military to use commercial fuels when specialized military fuels are not available. Use of standardized fuel may also save money for DOD by increasing DOD's ability to purchase distressed cargoes of commercial fuels at favorable prices.

EP believes that DOD's weapons systems may be able to use fuel that meets commercial specifications without prohibitive costs in maintainability and performance. If so, these systems are not as intolerant of commercial fuels as was believed in the 1950s and 1960s. Accordingly, it is important to identify the real limits on DOD's ability to use commercial fuels. It is also important to build sufficient flexibility into the logistics system to permit broader use of commercial specification fuels.

ACCOMPLISHMENTS

One DOD accomplishment in fuels standardization has been the progress toward adopting JP-8 jet fuel as a standard fuel in NATO. DOD took an important step toward such adoption in January 1985, when the U.S. Army agreed to modify its AH-1, OH-58, and UH-1 helicopters so that they would be better able to make unassisted starts in cold weather while using JP-8. (The modified helicopters will be able to make such starts at minus 25 degrees F when using JP-4 jet fuel, thus meeting the NATO criterion for unassisted cold starts. When using JP-8, they will be able to make such starts at minus 10 degrees F to minus 20 degrees F. Thus the modified helicopters will be closer to meeting NATO criteria. Other Army helicopters can already meet NATO cold-start criteria when using JP-8.) The Army's decision removed the ground on which some allies expressed skepticism about the U.S. commitment to JP-8 conversion.

Standardization on JP-8 involves both costs and benefits for NATO. Two European NATO nations, for example, have expressed reluctance to convert to JP-8 on grounds that it costs more than JP-4. A related cost is dependence on a fuel that comes from a narrower cut of the barrel. Among the benefits of JP-8 use is increased safety in refueling operations because it is less volatile than JP-4. In addition, conversion to JP-8 means that U.S. forces will increasingly be operable with a single fuel. (JP-8 can also be used in lieu of diesel fuel for Army and Air Force ground vehicles.) Finally, conversion to JP-8 should help make CEPS more attractive to potential commercial users because of its similarity to the commercial jet fuel, jet A-1.

A second accomplishment has been the drafting of a revised version of DOD Directive 4140.43 ("DOD Liquid Hydrocarbon Fuel Policy for Equipment Design, Operation, and Logistics Support," December 5, 1975). That directive was intended to reduce the number of fuels required by the military services and to increase their flexibility for using fuels that are readily available worldwide. Judging from the large number of military specification fuels currently used by DOD, the original directive has had only a small degree of success. DOD does buy some automotive gasolines and heating oils that meet commercial specifications, but for the most part, it has maintained the practice of relying on fuels that meet relatively stringent military specifications. The military services have not widely adopted commercial specification fuel because they contend that these fuels will adversely affect equipment performance and maintenance.

The draft revision of DOD Directive 4140.43 is intended to strengthen DOD policy on fuel standardization. It stresses the need for equipment to operate on a broadened specification fuel and for equipment to be designed with increased tolerance for a wider variety of commercially available fuel.

A third DOD accomplishment in fuels standardization has been the formation of the Defense Mobility

Fuels Action Group. The mission of that group is to coordinate Army, Navy, and Air Force research, development, test, and evaluation (RDT&E) efforts to solve problems involving fuel quality and availability in the foreseeable future. As an example of this coordination, the Navy participated in the Army's investigation of the long-term storage stability of DF-2 diesel fuel. (The Navy's participation reflects the fact that the properties of DF-2 are close enough to those of the Navy's F-76 to permit confident extrapolation of research results.)

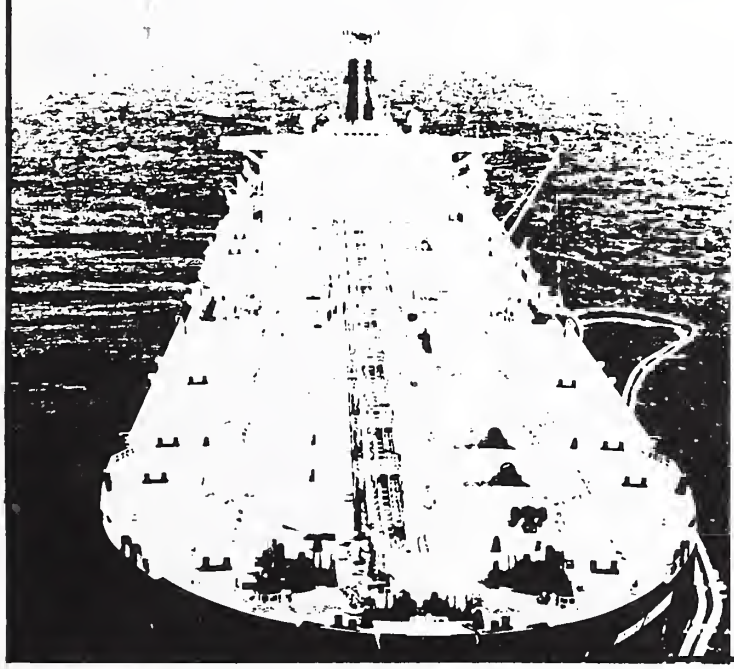
Creation of the Navy's Mobility Fuels Technology Program is another initiative that represents progress in DOD efforts at fuel standardization. That effort is important because the crude oil available on the world market is increasingly of poorer quality than crudes used in the past, because the military services must therefore be prepared to use fuels derived from the crudes that have undergone intensive processing, and because synthetic crudes are likely to be used to make oil products for the Navy in the future. Oil products made from such crudes can present problems in use even when they meet current military specifications.

PLANS

EP intends to make further progress toward fuel standardization and increased use of commercial specifications. For example, it plans to organize a government and industry symposium to address future trends in petroleum product quality versus DOD fuel requirements worldwide. In addition, EP intends to guide and encourage the services' efforts to identify the effects—in terms of reduced storage life, increased maintenance effort, and degraded performance—of introducing commercial fuels into the military distribution system. EP is also investigating the consequences of using commercial jet fuel during emergencies or over other short periods. It will determine where such use would have minimum adverse impact on military operations and how long deliveries of commercial fuels could be repeated.

EP also plans to support the services' efforts to evaluate current military fuel specifications and to assess whether those specifications can be modified to reflect their commercial counterparts (thus increasing availability) while still supporting military operations. (For example, the Navy's specifications for JP-5 currently call for a freeze point of minus 51 degrees F compared with the minus 40 degrees F required for the commercial fuel jet A-1. Instrumented flight tests and other research suggest that the JP-5 freeze point might be moved closer to the commercial standard and that doing so would increase the JP-5 available from a barrel of crude by 20 percent. Further analysis may illuminate both potential fuel acquisition savings associated with specification relaxation and the extent of potential performance/maintenance costs). As part of this effort, EP is sponsoring an evaluation of the marginal cost of producing military and commercial specification jet and ground fuels in various refining regions around the world. FL

When is a Coastal Tanker Not a Coastal Tanker?



DEAR EDITOR:

When is a Coastal Tanker Not a Coastal Tanker?

Page 13 of the Spring 1985 FUEL LINE *showed a photograph reprinted from the* ARMY LOGISTICIAN. *The caption erroneously identified two very large crude carriers (VLCCs) as coastal tankers.*

Peter A. Thorpe, Master, USNS Sealift Pacific, *who wrote to correct the error, also noted, "Possibly of interest to your readers would be a fuller explanation of the picture on page 19 of the same issue. It is also a VLCC . . . it has seven 'Yokohama' type fenders ranged along its starboard side. This allows smaller vessels to come alongside to lighter the VLCC."*

First Maritime Pre-Positioning Ship Squadron Deployed

DFSC recently loaded the sixth of 13 maritime prepositioning ships (MPS) at Defense Fuel Support Point Norfolk, Va. The ship was loaded with about 16,000 barrels of JP-5 jet fuel and 3,000 barrels of motor gasoline. The secretary of defense approved the MPS program to increase the responsiveness of Marine Corps forces when rapid deployment is required. MPS-1, which is a four-ship squadron, has been loaded and is stationed in the eastern Atlantic Ocean. MPS-2, with five ships, will be located in the Indian Ocean. MPS-3, which has four ships and is the last squadron, will be positioned in the western Pacific Ocean by autumn 1986.

The U.S. Marine Corps and the Military Sealift Command have announced deployment of the first MPS squadron.

Designated MPS-1, the four-ship squadron carries enough equipment and supplies to sustain a heavily mechanized, 16,500-strong, Marine amphibious brigade for 30 days.

Captain Mark Hughes, public affairs officer for the 6th Marine Amphibious Brigade, Camp Lejeune, N.C., says pre-positioning gives the Marine Corps a new option for increasing its responsiveness to a request for rapid deployment. "The maritime pre-positioning goal," says Captain Hughes, "is to be able to constitute an operationally capable Marine amphibious brigade in an objective area within 10 days or less."

It takes approximately 30 to 45 days for Navy amphibious ships to arrive in port, load the necessary equipment, embark the landing force personnel, and deploy to the crisis area.

The ships, under Military Sealift Command charter, are manned by civilian crews and have been designed to permit on-board maintenance of equipment to ensure continual readiness.

The ships carry tanks, artillery, assault amphibious vehicles, antitank weapons, and a full range of support supplies.

"In an actual crisis," says Captain Hughes, "a 'surge crew' of about 100 Marines and sailors would be airlifted to the ships to prepare the equipment for immediate offload upon arrival in the objective area."

Meanwhile, air-transported-Marine amphibious brigade personnel, helicopters, and other critical equipment not included aboard the ships would join the ships in the objective area.

"Delays previously experienced in transporting equipment would be avoided, and the Marine amphibious brigade would be operational shortly after airlift is accomplished," Captain Hughes said.

General P. X. Kelley, commandant of the Marine Corps, said about the project, "I am a firm believer that an ounce of prevention is worth a pound of cure, and that when you have the ability to quickly move a 16,500-man Marine brigade to a crisis area, you have a ready-made prescription to prevent that crisis from escalating. MPS is just such a prescription."

Overall, 13 maritime pre-positioning ships will be formed into three squadrons. (MPS-2 is currently being formed.) FL

Maritime pre-positioning ships like the M. V. Private First Class William B. Baugh *are one of the Marine Corps' keys to providing rapid deployment wherever and whenever U.S. forces are needed.*

Coal Outlook 1985

Frank J. Slevin, chief of the DFSC Coal Branch, Specialty Fuels Division, Directorate of Contracting and Production, gave the following presentation at the annual Coal Outlook Conference.

The center's coal purchases total about 2 million tons each year. This coal is used primarily for heating purposes. There are no federal or uniform specifications. The installations using the coal determine specifications based on the equipment in which the coal will be used.

Of the 2 million tons of coal purchased each year, over 400,000 tons is purchased in Alaska. This coal is for military installations in the Fairbanks area. The coal is supplied by the Usibelli Coal Mine in Healy, the only operating mine in the state. This is subbituminous coal averaging about 25 percent moisture and 8000 "as-received" British thermal units (Btu).

Another 500,000 tons of coal is purchased each year for military bases in the Federal Republic of Germany. This is all U.S. mined coal shipped in U.S. flag ships. The coal is delivered free-on-board (f.o.b.) destination with the government providing the ocean transportation. About half of the tonnage is anthracite and half is bituminous. The anthracite coal is mined in eastern Pennsylvania and shipped through the port of Philadelphia. The bituminous coal is frequently shipped through Norfolk or Newport News, Va. Three sizes of anthracite are purchased: stove, nut, and pea. The bituminous coal is a stoker product, 1.25 inches by one-quarter inch, with a maximum sulfur content of 1 percent and 13,800 minimum dry Btu.

We purchase an additional 1 million tons of coal each year for use in the continental United States (CONUS). This includes about 100,000 tons in the West, 150,000 tons in the Midwest, and 750,000 tons in the East. Most of this coal is a stoker or modified stoker product averaging about 1 percent sulfur and 13,000 Btu. We purchase about 50,000 tons of anthracite coal each year for domestic use. Some installations require delivery by truck. These contracts are awarded f.o.b. destination. Other contracts are awarded f.o.b.-rail-cars-at-mine.

We purchase coal in CONUS for approximately 60 installations with many of these located in the East. The annual consumption at these bases ranges from a low of 3,500 tons a year to a high of 100,000 tons a year with the majority of requirements in the 10,000 to 40,000 ton range.

Bidders are required to have the coal they are offering sampled by the Department of Energy prior to submitting a bid. This provides some assurance to the government that the coal offered will meet our specifications. Contracts are awarded on an as-received-Btu basis. The delivered coal is sampled at destination. The analysis of this sample is the basis for payment under the contract. Payment is made based on Btu values received. We award fixed-price-requirement-type contracts which cover a 12-month period.

Some bids are restricted to small business concerns; others are unrestricted—open to large and small businesses. If adequate competition is anticipated from two or more responsible small business suppliers, a bid can be set aside for participation by small business firms only. To qualify as a small business concern, a company (including any divisions or affiliates) must employ no more than 500 people and not be dominant in the field in which it is bidding. There is also a minority contracting program under which the Small Business Administration requests reservations for specified minority companies. We contract with coal brokers as well as coal producers.

Both sealed bidding and negotiated bidding procedures are used. Under sealed bidding procedures, the award is made to the lowest responsive and responsible bidder. Any exception to bid requirements will render the bid non-responsive. In negotiated bids there is generally a discussion of price and terms. Offers are evaluated based on as-received-Btu. The low evaluated offer is the bidder providing the largest number of Btu per penny. The evaluation takes into consideration the coal price, transportation cost, moisture, and Btu guarantee.

DFSC contracts are awarded on a fixed-price basis with several escalation provisions (such as labor and freight for f.o.b. destination contracts). Payments are made based on Btu value received. The price is adjusted up or down based on as-received-Btu. DFSC contracts include a penalty provision for coal which exceeds ash or sulfur limits.

We do not anticipate a substantial increase in tonnage purchased. However, due to some scheduled conversions to coal, we do expect a small increase in the amount of coal we purchase for domestic use. FL

DFSP Rodman Sells Leftover Fuel Oil

by Lieutenant J. E. Lubbers, Supply Corps, U.S. Navy

Posed at tank 15-182's tank tunnel, the May 22, 1985, operations crew awaits word to complete the lineup for issue of Navy special fuel oil to the Panama Canal Commission. A 20,000-barrel issue, the first of several, was made that day under an unusual arrangement which solved problems and saved money.

From left to right, foreground, are: V. McNamee, gauger; P. Ortega, pump operations helper; F. Burac, operations control desk employee; P. Diaz, gauger; and C. Kinsman, pumper. At the rear is Lieutenant Lubbers, fuel depot officer at DFSP Rodman.

Defense Fuel Support Point (DFSP) Rodman, Panama, was recently able to move its leftover navy special fuel oil (NSFO) by means of a negotiated sale with the Panama Canal Commission (PCC) at an estimated savings of $5 million. The commission is Rodman's largest customer for which about 1.5 million barrels of commercial bunker C fuel are handled annually for use in a steam-driven electrical generating plant at the Miraflores Locks of the Panama Canal.

Rodman's NSFO stocks of 210,000 barrels had deteriorated beyond specification because of low turnover and would have yielded a cost of at least $6.2 million to the stock fund if surveyed. The DFSP's fuel depot officer, Lieutenant Ed Lubbers, was able to elicit from PCC a bid of $24.50 per barrel versus the standard fiscal 1985 price. This "markdown" attempted to compensate for the lower specific heat of NSFO versus the heavier bunker C fuel, and for the cost per British thermal unit which the commission was paying by purchasing its fuel from the commercial spot market.

This negotiated pricing structure recovered nearly 86 percent of the current NSFO standard price and solved a dormant stock problem. Fallout from the sale included such advantages as opening up 250,000 barrels of storage for "clean" products, reducing operating costs for the PCC, and providing an opportunity for more efficient slating of tanker fuel deliveries and better physical security.

DFSP Rodman employees worked closely with Navy Commander L. A. Van Rooy Jr., Supply Corps, formerly chief of the Inventory Management Division, DFSC Directorate of Supply Operations, and Jeune Hershey, of the same division, to make the sale. FL

Lieutenant Lubbers is the fuel depot officer at Defense Fuel Support Point Rodman, U.S. Naval Station Panama Canal, Panama.

Contract Awards/Contract Awards/Contract Awards/Contract Awards/Contract

The Office of the Assistant Secretary of Defense for Public Affairs recently released the following list of contracts awarded by DFSC with a value over $3 million. This information is not intended to be comprehensive and does not reflect an up-to-date tally of all contracts awarded by DFSC.

Steuart Petroleum Co. of Washington, D.C., was awarded a $20,390,911 modification to a fixed-price-with-economic-price-adjustment contract for 28,800,300 gallons of distillates and residuals. Work will be performed in Maryland, Virginia, and the District of Columbia and is expected to be completed by July 31, 1986. Contract funds will not expire at the end of the current fiscal year. Three hundred sixty-nine bids were solicited and 144 received. (DLA600-85-D-4544).

City Transfer of Kent, a small business based in Kent, Wash., was awarded a $3,447,455 modification to a fixed-price-with-economic-price-adjustment contract for 5,225,000 gallons of burner oil. Work will be performed in Richland, Wash., and is expected to be completed by June 30, 1986. Contract funds will not expire at the end of the current fiscal year. Two hundred fifty-four bids were solicited and 61 received. (DLA600-85-D-4384).

Steuart Petroleum Co., Washington, D.C., is being awarded a $7,381,185 modification to a fixed-price-with-economic-price-adjustment contract for 10,082,300 gallons of distillates and residuals. Work will be performed in Maryland, Virginia, and the District of Columbia and is expected to be completed by July 31, 1986. Three hundred seventy-nine bids were solicited and 51 received. (DLA600-85-D-4544).

Belcher New England Inc., Revere, Mass., is being awarded a $4,389,471 fixed-price-with-economic-price-adjustment contract for 5,330,000 gallons of motor gasoline, diesel fuel, and fuel oil. Work will be performed in Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island and is expected to be completed by August 1986. Contract funds will not expire at the end of the fiscal year. Four hundred seventy-five bids were solicited and 96 received. (DLA600-85-D-4595).

Ultramar Petroleum Inc., Montvale, N.J., is being awarded a $5,848,435 fixed-price-with-economic-price-adjustment contract for 8,569,000 gallons of various fuel oils. Work will be performed in Connecticut and Vermont and is expected to be completed by August 1986. Contract funds will not expire at the end of the current fiscal year. Four hundred seventy-five bids were solicited and 96 received. (DLA600-85-D-4634).

Amoco Oil Co., Oak Brook, Ill., is being awarded a $3,822,547 fixed-price-with-economic-price-adjustment contract modification for 5,075,000 gallons of gasolines and distillates following competition in which 377 bids were solicited and 51 bids were received. The work will be performed in the states of Kentucky and Virgina. (DLA600-85-D-4476, P00002).

Petron Trading Co., Exton, Pa., a small business, was awarded a $4,942,505 fixed-price-with-economic-price-adjustment contract for 6,292,000 gallons of distillates. Work will be performed in Maryland, Virginia, and the District of Columbia and is expected to be completed by September 30, 1986. Contract funds will not expire at the end of the current fiscal year. Two hundred forty bids were solicited and 25 received. (DLA600-85-D-4669).

Amerada Hess Corp., New York, N.Y., is being awarded a $7,475,571 fixed-price-with-economic-price-adjustment contract for 11,753,000 gallons of various burner oils. Work will be performed in New Jersey, New York, and Pennsylvania. Contract funds will not expire at the end of the current fiscal year. Four hundred eleven bids were solicited and 129 received. (DLA600-85-D-4711).

North East Petroleum Corp., Chelsea, Mass., is being awarded an $11,195,857 fixed-price-with-economic-price-adjustment contract for 15,558,000 gallons of fuel oils. The work will be performed in Maine, Massachusetts, and Rhode Island and is expected to be completed by August 1986. Contract funds will not expire at the end of the current fiscal year. Four hundred seventy-five bids were solicited and 96 received. (DLA600-85-D-4626).

Steuart Petroleum Co., Washington, D.C., has been awarded a $3,048,800 modification to a fixed-price-with-economic-price-adjustment contract for 4,000,000 gallons of fuel oil. Work will be performed in Maryland, Virginia, and the District of Columbia and is expected to be completed by September 30, 1986. Contract funds will not expire at the end of the fiscal year. Two hundred forty bids were solicited and 25 received. (DLA600-85-D-4672).

Amerada Hess Corp., New York, N.Y., has been awarded a $3,888,425 modification to a fixed-price-with-economic-price-adjustment contract for 5,762,800 gallons of burner oil. Work will be performed in Maryland, Virginia, and the District of Columbia and is expected to be completed by September 30, 1986. Contract funds will not expire at the end of the fiscal year. Two hundred forty bids were solicited and 25 received. (DLA600-85-D-4665).

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DFSC CONTRACTS

Petron Trading Co., Inc., a small business in Exton, Pa., is being awarded a $4,960,745 fixed-price-with-economic-price-adjustment contract for 6,278,000 gallons of gasoline, diesel fuel, and burner oil. Work will be performed in Pennsylvania and New Jersey. Contract funds will not expire at the end of the current fiscal year. Four hundred eleven bids were solicited and 129 received. (DLA600-85-D-4737).

Sears Petroleum and Transport Corp., a small business in Rome, N.Y., is being awarded an $8,339,570 fixed-price-with-economic-price-adjustment contract for 12,092,460 gallons of gasoline, diesel fuel, and various burner oils. Work will be performed in New York. Contract funds will not expire at the end of the current fiscal year. Four hundred eleven bids were solicited and 129 received. (DLA600-85-D-4744).

S.J. Fuel Co. Inc., a small business in Brooklyn, N.Y., is being awarded a $4,460,450 fixed-price-with-economic-price-adjustment contract for 5,692,500 gallons of diesel fuel and burner oil. Contract funds will not expire at the end of the current fiscal year. Four hundred eleven bids were solicited and 129 were received. (DLA600-85-D-4748).

Grace Petroleum Co., a small business in Utica, N.Y., is being awarded a $5,418,095 fixed-price-with-economic-price-adjustment contract for 7,777,000 gallons of gasoline, diesel fuel, and burner oil. Work will be performed in New York. Contract funds will not expire at the end of the current fiscal year. Four hundred eleven bids were solicited and 129 received. (DLA600-85-D-4704).

Apex Oil Co., St. Louis, Mo., has been awarded a $15,472,811 modification to a fixed-price-with-economic-price-adjustment contract for 21,405,205 gallons of various burner oils. Work will be performed in Maryland, Virginia, and the District of Columbia and is expected to be completed by September 30, 1986. Contract funds will not expire at the end of the fiscal year. Two hundred forty bids were solicited and 25 received. (DLA600-85-D-4662).

Steuart Petroleum Co., Washington, D.C., is being awarded a $3,884,805 fixed-price-with-economic-price-adjustment contract for 4,684,510 gallons of various burner oils. Work will be performed in Maryland, Virginia, and the District of Columbia and is expected to be completed by September 30, 1986. Contract funds will not expire at the end of the current fiscal year. Two hundred forty bids were solicited and 25 received. (DLA600-85-D-4672).

Castle Coal and Oil Co., a small business in Bronx, N.Y., is being awarded a $3,992,551 fixed-price-with-economic-price-adjustment contract for 5,031,000 gallons of diesel fuel and burner oil. Work will be performed in New York. Contract funds will not expire at the end of the current fiscal year. Four hundred eleven bids were solicited and 129 received. (DLA600-85-D-4690).

Farm and Home Oil, a small business in Telford, Pa., is being awarded a $5,123,781 fixed-price-with-economic-price-adjustment contract for 6,980,000 gallons of gasoline, diesel fuel, and various burner oils. Work will be performed in Pennsylvania and New Jersey. Contract funds will not expire at the end of the current fiscal year. Four hundred eleven bids were solicited and 129 received. (DLA600-85-D-4703).

Crescent Refining and Oil Co., a small business in Los Angeles, Calif., is being awarded a $4,731,805 fixed-price-with-economic-price-adjustment contract for 6,082,900 gallons of gasoline, diesel fuel, and burner oil. Work will be performed in California and is expected to be completed by October 31, 1986. Contract funds will not expire at the end of the current fiscal year. Four hundred eighteen bids were solicited and 93 received. (DLA600-85-D-4799).

Cool Fuel Inc., a small company in Paramount, Calif., is being awarded a $5,391,185 fixed-price-with-economic-price-adjustment contract for 6,426,700 gallons of gasoline, diesel fuel, and burner oil. Work will be performed in Arizona and California and is expected to be completed by October 31, 1986. Four hundred eighteen bids were solicited and 93 received. (DLA600-85-D-4803).

J.E. Dewitt Inc., a small business in South Elmonte, Calif., is being awarded a $7,262,604 fixed-price-with-economic-price-adjustment contract for 8,712,900 gallons of gasoline and diesel fuel. Work will be performed in California and is expected to be completed by October 31, 1986. Contract funds will not expire at the end of the current fiscal year. Four hundred eighteen bids were solicited and 93 received. (DLA600-85-D-4810).

E-Z Serve of California Inc., a small business in Ontario, Calif., is being awarded a $6,833,524 fixed-price-with-economic-price-adjustment contract for 8,361,900 gallons of gasoline and diesel fuel. Work will be performed in California and is expected to be completed by October 31, 1986. Contract funds will not expire at the end of the current fiscal year. Four hundred eighteen bids were solicited and 93 received. (DLA600-85-D-4813).

River City Petroleum Inc. of West Sacramento, Calif., is being awarded a $9,100,257 fixed-price-with-economic-price-adjustment contract for 11,053,850 gallons of gasoline and diesel fuel. Work will be performed in Arizona, California, and Nevada and is expected to be completed by October 31, 1986. Contract funds will not expire at the end of the current fiscal year. Four hundred eighteen bids were solicited and 93 received. (DLA600-85-D-4842).

Kodiak Oil Sales Inc., a small business in Kodiak, Alaska, is being awarded a $3,332,580 fixed-price-with-economic-price-adjustment contract for 3,720,000 gallons of distillates. Work will be performed at various locations in Alaska and is expected to be completed by September 1986. Contract funds will not expire at the end of the current fiscal year. One hundred sixty-three bids were solicited and 34 received. (DLA600-85-D-1324). FL

Test Your Knowledge:

Do You Know Your OSHA, API, NFPA, and ANSI Codes?

by Paul Rogers

The Occupational Safety and Health Act of 1970 was passed into law "to assure so far as possible, every working man and woman in the nation safe and healthful working conditions." The act established the Occupational Safety and Health Administration (OSHA), and authorized the enforcement of OSHA's standards.

To ensure the safety of personnel and product at fuel facilities and during fuel handling operations, DFSC applies not only OSHA standards, but also those of the American Petroleum Institute, the National Fire Protection Association (which provides the National Fire Codes), and the American National Standards Institute. Equally important sources include contractual safety guidelines and Defense Department petroleum regulations and manuals.

Our goal is to minimize the opportunity for injury, property damage, and product losses, and to provide a safe and healthful working environment for our personnel in our facilities.

Enforcement of safety codes and standards helps us attain our goal by providing a safe workplace. Achieving a totally safe working environment, however, requires the efforts of each individual, performing conscientiously, armed with an awareness of the potential hazards of the workplace and the accepted safety practices and procedures to follow to avoid an accident or injury.

This and subsequent FUEL LINE articles will review recommended safe working procedures, increase your awareness of potential hazards, and provide some basic insight into how codes and standards apply to the petroleum industry.

The following short quiz was developed to test your knowledge about safety and health. Use it as a self-evaluation of your awareness of safety issues.

1. The hazard potential or flammability rating of a liquid is determined by its:
   a. Vapor pressure
   b. Autoignition temperature
   c. Flash point
   d. Boiling point

2. A vacuum motor in a laboratory catches fire while a quality surveillance representative is performing tests. An extinguisher rated for which class of fire should be used?
   a. Class A b. Class B c. Class C d. Class D

3. A metal flammable-liquid storage cabinet is received from the manufacturer with a plug installed in the vent hole. This plug should be removed before placing the cabinet in service.
   a. True b. False

4. A small fire breaks out during truck loading; the first emergency action should be:
   a. Extinguish fire with extinguisher
   b. Call fire department
   c. Shut off fuel
   d. Run

5. Storage tanks present unusual electrostatic hazards due to their large size. The insertion of objects into the vapor space for gauging or sampling should not be permitted until 3 minutes has elapsed after completion of filling.
   a. True b. False

6. During cold weather, the engine of a tank truck in the process of loading can be kept running to provide necessary heat.
   a. True b. False

7. In the absence of an infirmary, clinic, or hospital in proximity to the workplace (bulk fuel terminal), which of the following do you think is required by OSHA?
   a. First aid kit
   b. At least one employee trained in first aid
   c. An emergency eyewash and shower
   d. All of the above

8. A portable power hand tool with a metal case, such as a drill or a circular saw, does not need to be grounded if it is not used around flammable vapors.
   a. True b. False

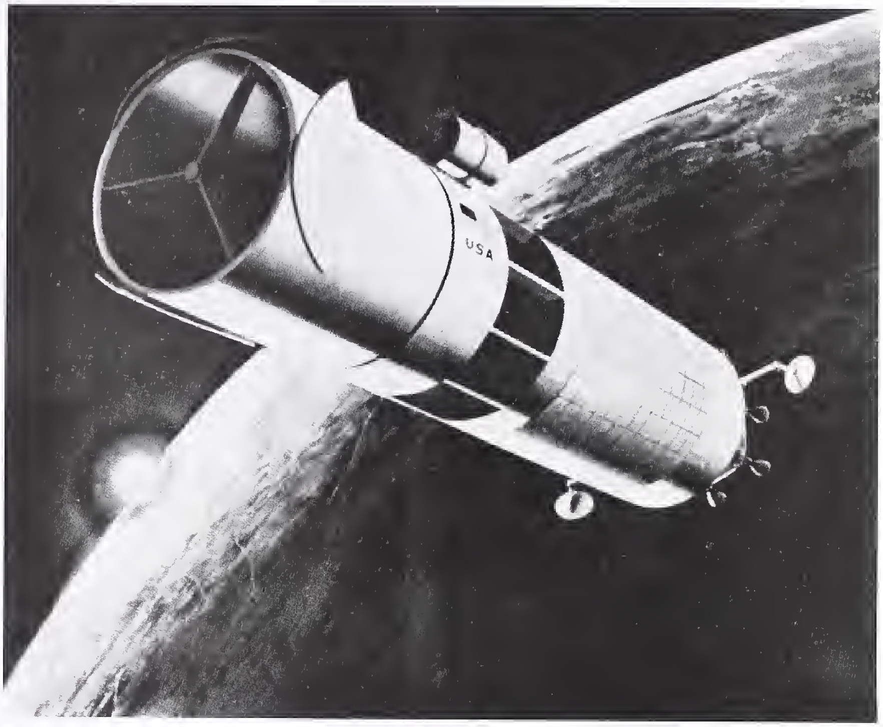
9. Unlike gasoline, the flammable vapors of JP-4 jet fuel aren't likely to travel long distances along the ground before reaching a point of ignition and flashing back.
   a. True b. False

10. The use of fuels for cleaning purposes is acceptable if all electrical equipment and components in the immediate vicinity are explosion-proof.
   a. True b. False

Answers to the safety and health quiz may be found on page 29.

Paul Rogers is the DFSC safety and health officer.

Update on the Strategic Defense Initiative



Wouldn't it be great if the same scientific advances that resulted in the creation of intercontinental ballistic missiles could eliminate the threat imposed by those missiles?

This was the question President Ronald Reagan posed in March 1983 when he challenged the scientific community to determine if such a project was feasible.

Since then, government, university, and industrial scientists have made significant progress in designing technology that may offer a defense against ballistic missiles.

Considerable scientific advances have been made in the areas critical to the Strategic Defense Initiative (SDI): kinetic energy and directed energy research, surveillance satellite experiments, and the development of computer hardware and software to keep pace with the demands of this research.

Many of these advances are outlined in the SDI Organization's (SDIO) 1985 technical progress report.

One of the most significant of these demonstrates a key principle upon which SDI is based—that you can hit a bullet with a bullet in space.

In June 1984, scientists at Kwajalein Army Missile Test Range in the South Pacific fired a missile into space. A second missile fired from Vandenberg Air Force Base, Calif., more than 5,000 miles away, was sent streaking into space. It intercepted the first missile and destroyed it.

The test proved that a non-nuclear interceptor launched from a fixed ground base can destroy an incoming ballistic missile outside the earth's atmosphere. Defensive weapons like these are expected to be an essential part of the SDI's multilayered defense system.

Another recent experiment shows the significance of lasers and particle beams to advanced weapons concepts.

Scientists at the University of California's Lawrence Livermore National Laboratory demonstrated that lasers, intense beams of light, can create a fixed course for particle beams, the bolts of energy that would destroy incoming ballistic missiles.

This experiment shows that although particle beams have a positive atomic charge and are affected by the earth's magnetic forces, the force of these beams can remain fixed on a specific enemy missile through the use of lasers.

A recent space shuttle mission played a part in another significant SDI experiment, one which showed that ground-based lasers can pass through the earth's atmosphere with minimum distortion.

This is significant because the more a laser beam is distorted and diffused by the atmosphere, the less power and strength it will have when it reaches its target in space.

Scientists at the Air Force's Maui Optical Station in Hawaii directed a high-power laser beam toward an 8-inch reflector in the orbiting shuttle's hatch window. The beam was reflected back to the facility.

These are just a few examples of the many scientific advances being explored under the SDI research program.

"SDIO has found no lack of ideas or people and facilities willing to contribute to this effort," the report noted. "Perhaps the most encouraging progress is the awareness that this country and its allies have the capability and resources to address the technical challenges associated with SDI research." FL

What's in a Barrel of Oil?

The yield from an average barrel of crude oil refined in the United States varies from year to year and depends on:

- —Demand for specific products;
- —Type and quality of available crude oil, such as high sulfur or low sulfur oil and its relative weight, viscosity ("thickness"), and chemical composition; and
- —Capability of a refining facility to separate the various components present in the crude oil.

Most refineries can vary the yield somewhat. ("Yield" is defined as the proportions of the products refined from a barrel of crude oil.) These proportions are adjusted to meet consumer demand. In the late fall, for example, refiners increase the proportion of distillate (which includes home heating oil) produced from a barrel of crude oil to meet winter demand. In the spring, refiners reduce the distillate yield and increase the gasoline yield in preparation for the summer driving season. In this way, refiners can substantially increase the output of the products that are in demand, while maintaining relatively stable operating levels and without necessarily increasing production of other petroleum products.

The *quality* of the crude oil being refined also affects the proportions of the products, as does the available *quantity* of a particular crude oil. In recent years, the United States has been relying, to a large extent, on oil having a higher sulfur content and lower quality than some other types of crude oil. These high sulfur, lower-quality oils frequently require additional processing and produce less of the more volatile parts of the crude oil—such as gasoline and distillates. Overall, however, the average product yield has not changed substantially in the past several years, as indicated by the adjacent table:

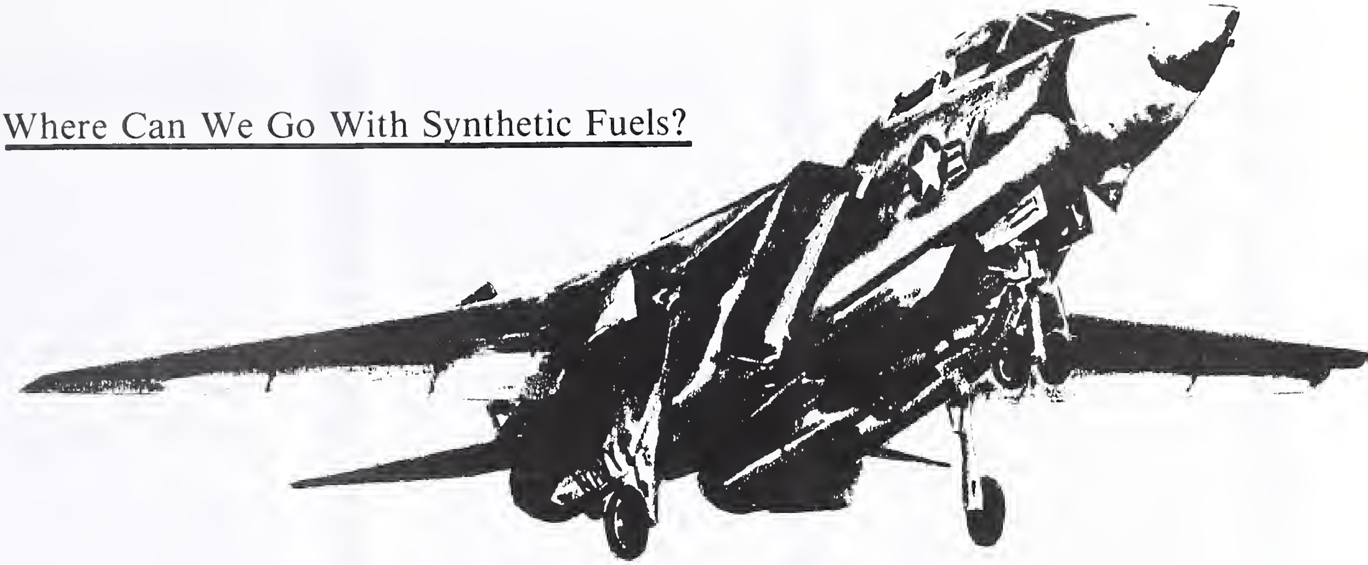
PERCENTAGE YIELDS OF REFINED PRODUCTS

FROM CRUDE OIL IN THE UNITED STATES—1981-1984

Product	*1981*	*1982*	*1983*	*1984*
Gasoline[1]	44.8%	46.4%	47.6%	46.7%
Jet fuel[2]	7.6	8.1	8.5	9.1
Liquefied gases	2.4[3]	2.2	2.7	2.9
Kerosene	0.9	0.9	0.9	0.9
Distillate fuel oil	20.5	21.5	20.5	21.5
Residual fuel oil	10.4	8.8	7.1	7.1
Petrochemical feedstocks	4.5	3.4	3.3	2.8
Special naphthas	0.6	0.4	0.5	0.4
Lubricants	1.3	1.2	1.2	1.3
Waxes	0.1	0.1	0.1	0.1
Coke	3.1	3.4	3.5	3.5
Asphalt (including road oil)	2.7	2.7	3.1	3.1
Still gas[4]	4.5	4.6	4.6	4.5
Miscellaneous	0.7	0.7	0.5	0.5
Shortage (processing gain)[5]	−4.2	−4.4	−4.1	−4.4
Total	100.0%	100.0%	100.0%	100.0%

1 Gasoline includes both motor and aviation gasoline.
2 Jet fuel includes both naphtha-type and kerosene-type fuel.
3 Figure for 1981 includes 0.1 percent ethane and ethylene.
4 Still gas (refinery gas) is that gas produced in refineries during the refining and cracking processes.
5 Shortage (processing gain) represents the amount by which total refinery output is greater that the total input for a given period. The difference is due to the processing of crude oil into products which, in total, have a greater volume than the crude oil from which those products were made. FL

Where Can We Go With Synthetic Fuels?



"These aircraft fuel developments all evolved from innovations in petroleum-based products. However, it was not until 20 years later, in 1970, that the military began expanding into non-traditional fuels. As early as 1920, the military services recognized the potential of shale and other fuel sources, but lacked the push needed to act. There had simply never been any significant problem in getting fuel."

The current status of defense energy supplies is excellent. We have about 100 million barrels of fuel in storage and in transit. We are getting approximately 200 percent coverage for most of our product solicitations. And—as you are aware—petroleum prices have declined significantly.

All of this is good news.

We recognize, even in the happy condition we now find ourselves, that the years to come will bring petroleum shortages and that the Defense Department will have some energy problems to confront. Thinking about the future pushes us back to the dilemmas and solutions of the past. I would like to explore, for a just a few minutes, the Department of Defense's (DOD) history in obtaining fuel from a variety of sources, using a variety of innovative processes.

In the late 1930s and early 1940s, the low quality of aviation fuels affected the modernization of aircraft systems. The Defense Department became involved in a major program to produce high-octane fuel for these "modern" aircraft. This led to DOD subsidizing refiners who established alkylation units. This program was phased out around 1960.

The late 1940s and the next decade were marked by major developments in the turbine engine. One of the most significant advances, to my knowledge, was the SR-71 aircraft, which became operational around 1962. This plane was far ahead of its time and is still useful to today's Air Force. In concert with turbine engine developments, considerable turbine fuel research was conducted. Much of this research centered on chemical compounds in fuels and is still applied today to produce high-density fuels for advanced military turbine engines.

These aircraft fuel developments all evolved from innovations in petroleum-based products. However, it was not until 20 years later, in 1970, that the military began expanding into non-traditional fuels. As early as 1920, the military services recognized the potential of shale and other fuel sources, but lacked the push needed to act. There had simply never been any significant problem in getting fuel. In 1971, the COED (Char-Oil) energy development process produced coal liquids. In order to demonstrate that they were a viable fuel source, these liquids were propelled in ships experimentally. Along the same lines, 10,000 barrels of shale fuel was produced. Aircraft were flown using these fuels and some ships were operated under routine situations. Because these fuels did not meet specifications, however, they probably did more to cause concern about synthetic fuels than they did to promote their use.

In 1973 the Arab oil embargo accelerated the military's interest in alternative energy sources. In 1976 and 1977, the Navy began a major shale oil fuel development program in cooperation with the National Aeronautics and Space Administration, the Energy Department, the Air Force, and the Army. The program provided approximately 100,000 barrels of crude oil from shale on Naval oil shale Reserve Number 1. In 1978 this crude oil was refined into several military fuels. This JP-5 and JP-8 jet fuel and marine diesel fuel was used to test engines, fuel ships, and run all the major component systems. Heavy fuel oil from this effort was used in electric generating plants. The Environmental Protection Agency used the fuel to test emissions. The Army in Oak Ridge, Tenn., and the Navy/Air Force Lab at Wright-Patterson Air Force Base, Ohio, did considerable toxicology work on the shale oil.

In 1980, this time under Air Force sponsorship, we tried another form of processing, using crude oil produced by Geokinetics' in situ (in the original position) method.

Approximately 300 to 400 barrels of JP-4 jet fuel was produced using the H-Coal pilot plant to upgrade shale crude oil. The Air Force used this fuel for engine system component testing and found it satisfactory. It was never envisioned, however, that the H-Coal process would be used as a commercial process to upgrade shale to finished products.

In 1982 a contract was awarded to Geokinetics to upgrade about 80,000 barrels of shale crude oil into a slate of finished products. The crude oil included 40,000 barrels from Occidental's modified in situ process and the same amount from Geokinetics' in situ process. The program was completed in November 1983, with approximately 36,000 barrels of JP-4 produced.

This fuel was of excellent quality, and was used in extensive testing of aircraft engine components and helicopter systems. It was flight tested in advanced aircraft systems at Edwards Air Force Base (AFB), Calif., and at McClellan AFB, Calif. After these tests, the Air Force approved operational use of shale products in aviation systems. The validation program was planned for two bases: Mountain Home AFB, Idaho, and Hill AFB, Utah. All of the plans and contracts for this program have been in place for approximately 2 years. Unfortunately, the unavailability of shale crude oil has caused delays.

In 1981 we began some work with U.S. tar sands material. We have also used products from Canada. This upgraded material has led to a product which is similar to heavy petroleum crude oil. We had planned a large program with tar sands, but have been unable to obtain sufficient crude oil at reasonable prices to support refining.

In the area of coal liquids, we have had samples of finished fuels from coal produced by the Sasol process. The H-Coal pilot plant in Kentucky has also yielded considerable amounts of liquid from coal which are available to us. We have been generally unable to develop a coal-liquid program due to a lack of consistent feedstocks. The potential cost of coal liquids also appears to be a limiting factor. Nevertheless, in the latter phase of the Army's alcohol fleet tests we will be using some methanol from coal, which is available today. The alcohol program is slated to expand to a full-fledged, basewide testing program similar to what the Air Force was planning to do with shale.

This retrospective provides some valuable information on what we can use in the synthetic fuels arena, and how much of our energy needs can actually be fulfilled by these programs.

In evaluating our critical needs over the years, we have seen that mobility fuels have a high priority. These fuels require good handling characteristics, high British thermal unit yield per pound, stability, and low combustion residue. All of these qualities can be found in middle distillate fuels. Synthetic fuel sources such as coal, tar sands, and shale can produce these fuels under certain processes. In fact, with the proper selection of catalyst and processing conditions, almost any hydrocarbon source can provide a large quantity of middle distillate fuel.

As we have done in the past, we plan to take advantage of every base material that meets DOD specifications and can be used to provide energy. We have never viewed synthetic fuels as a solution, but as another option in meeting our energy needs.

For our part, every effort is being made to expand our specifications to permit a wide range of fuels and sources. I am sure that some of our suppliers are tired of receiving requests for fuels that deviate widely from current specifications, but these fuels will help the military evaluate materials for use in emergencies. We have also attempted to decrease the time required to qualify engines for fuel which does not meet current specifications.

If you look at where we wanted to be by this time in 1985, as opposed to where we actually are, you would have to note the following:

—We expected that we would be 2 years into our validation testing on shale, that we would have the data we needed to make this fuel fully operational within the system. By 1986 we expected we would be producing 60,000 barrels per day or so of shale oil.

—We thought there would be at least one or two coal liquefaction plants producing.

—Although tar sands products are a lower quantity resource, we expected production at a much faster pace. We expected the same of heavy crude oils.

—Finally, we expected that, thanks to some of these sources, we would have most engine testing completed. We thought we would be in a position to do a considerable amount of work on most synthetic fuels' sources, including heavy oils, tar sands, shale, and coal.

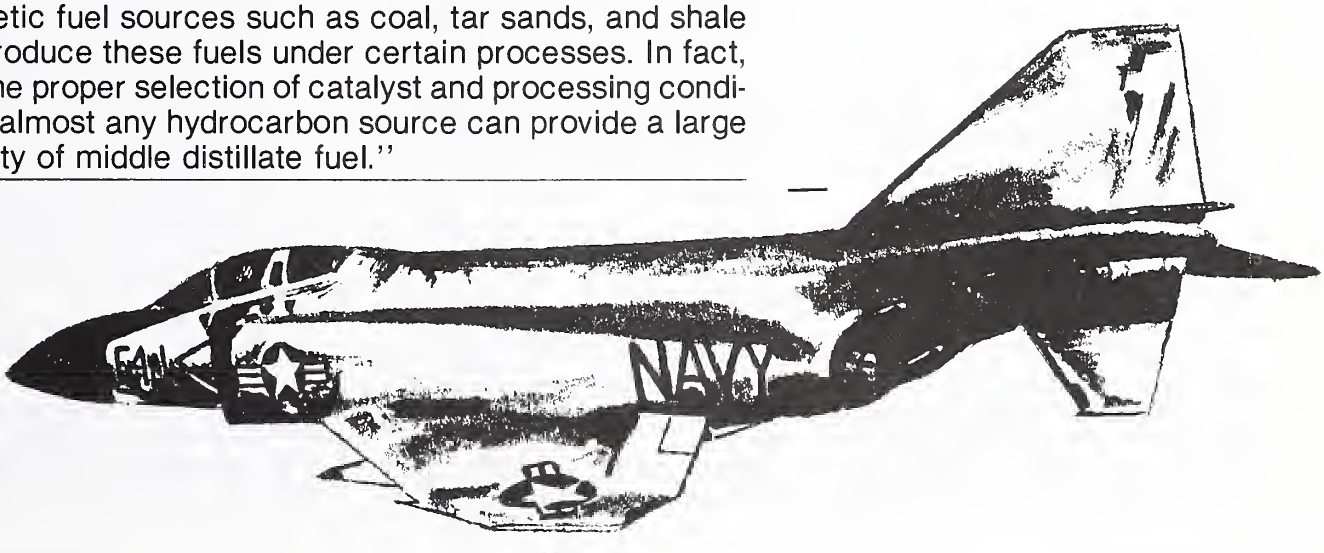
Nevertheless, the research conducted in the 1950s and 1960s is being used to help us in solving our problems today. The knowledge gained and processes completed have not been lost. Researchers of the future will benefit from what we have done over the past few years.

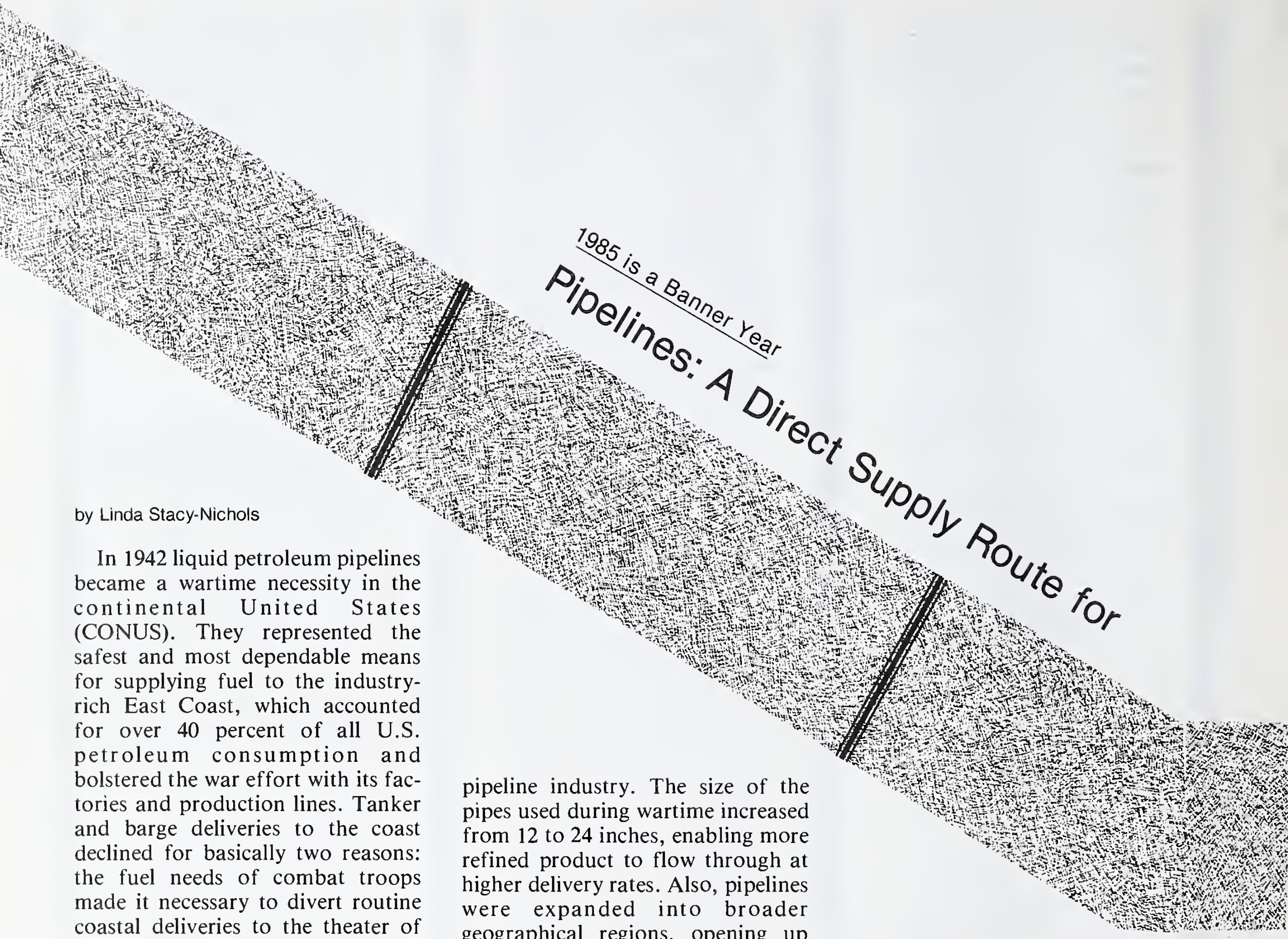
Now, turning to our current energy situation: It would fit our plan if we could go to some synthetic fuels' producers and obtain fuels in the same fashion that we are getting fuel from the Union Co. The Union agreement was signed in 1981 under the Defense Production Act Fast Start Program. We are currently receiving 10,000 barrels per day of products on the Gulf and West Coast from Union. These products have been supplied for about 2 years, and in our view, this is a very good agreement. Try as we may, we have not been able to make any new agreements of this type and we do not see any on the horizon.

I want you to know that although we have adjusted some programs, we expect to stay active in developing alternate energy sources. Some programs are working and we expect to continue our involvement in shale, tar sand, and coal projects whenever possible. FL

"In evaluating our critical needs over the years, we have seen that mobility fuels have a high priority. These fuels require good handling characteristics, high British thermal unit yield per pound, stability, and low combustion residue. All of these qualities can be found in middle distillate fuels. Synthetic fuel sources such as coal, tar sands, and shale can produce these fuels under certain processes. In fact, with the proper selection of catalyst and processing conditions, almost any hydrocarbon source can provide a large quantity of middle distillate fuel."

This address was given by Eddie French, chief of the Office of Synthetic Fuels, before the National Council on Synthetic Fuels on October 14, 1985.





1985 is a Banner Year

Pipelines: A Direct Supply Route for

by Linda Stacy-Nichols

In 1942 liquid petroleum pipelines became a wartime necessity in the continental United States (CONUS). They represented the safest and most dependable means for supplying fuel to the industry-rich East Coast, which accounted for over 40 percent of all U.S. petroleum consumption and bolstered the war effort with its factories and production lines. Tanker and barge deliveries to the coast declined for basically two reasons: the fuel needs of combat troops made it necessary to divert routine coastal deliveries to the theater of operations, and the enemy destroyed other tankers (including 48 on the U.S. East Coast during 4 months in 1942).

Tanker diversions and the annihilation of the usual supply routes spawned action by government and industry. Troops needed petroleum products to fight with and U.S. industry needed fuel to sustain production of war machinery and supplies. A total of 35 separate pipeline projects were planned to compensate for the loss of coastal deliveries and the sluggish pipeline development which had been characteristic of peacetime.

Over 17,680 miles of system improvements were added in 2 years; fuel deliveries via pipelines rose from 50,000 barrels to 750,000 barrels daily. Two other improvements had a significant effect on the pipeline industry. The size of the pipes used during wartime increased from 12 to 24 inches, enabling more refined product to flow through at higher delivery rates. Also, pipelines were expanded into broader geographical regions, opening up more and more sources of supply and market areas.

Now, in the four decades since World War II stimulated growth in the pipeline industry, the Defense Department has come full circle: DFSC customers are reaping the benefits of technology borne from military necessity. 1985 was a banner year for DFSC pipeline connections, with several major projects completed or underway:

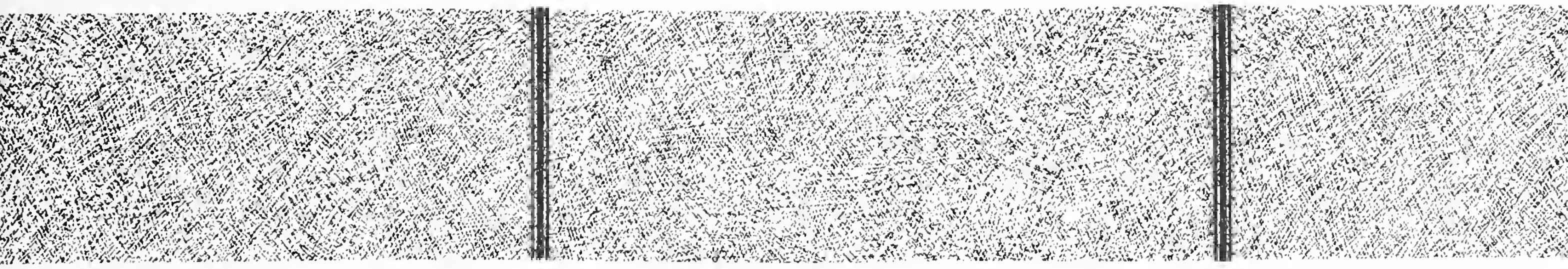
—Delivery of JP-4 jet fuel to Altus Air Force Base (AFB), Okla., began on August 8, 1985. The base, which consumes about 3,000 barrels of jet fuel daily, formerly received its petroleum via tank truck. The pipeline connection will save about $500,000 per year in transportation costs.

—In August and September 1985, new pipeline service was established to connect refineries at Deer Park and Corpus Christi, Texas, with a strategic Defense Fuel Support Point in Houston, Texas. The support point previously received JP-5 jet fuel and diesel fuel marine by barge. The pipeline connections will save about $150,000 annually in transportation costs.

—In response to the assignment of the modern B-1 bomber, the flow rate of the pipeline serving Dyess AFB, Texas, was greatly improved to meet increased jet fuel requirements.

—The Defense Fuel Support Point Norfolk, Va., is scheduled to begin receiving its fuel via pipeline in December. The new transportation mode will save about $1.6 million annually in transportation costs.

Many DFSC Customers



These organizations are joining over 85 Air Force, Navy, Army, Marine Corps, and other Defense Department activities which receive refined petroleum products via pipeline, a quiet, safe, dependable, and energy efficient form of transportation.

And the number of pipeline users will not stop at 85.

Gerritt Beatty, chief of the Transportation Division in the DFSC Directorate of Supply Operations, guides a four-person pipeline group in evaluating all DFSC customers for possible pipeline service. Meanwhile, DFSC's Defense Fuel Region (DFR) employees are constantly evaluating the needs of DFSC customers, using initiative and imagination to develop pipeline routes. At the present time, there are 28 activities being actively considered for pipeline service; most of them are Air Force bases (which consume large amounts of fuel).

"We are all enthusiastic about pipelines," says Mr. Beatty. "The economic future of the petroleum industry is pipelines."

Statistics support this conclusion. CONUS pipelines now move more than 223.7 ton miles of petroleum products annually, more than 53.7 percent of the total transported in the United States, a jump of 10 percent in the last decade. DFSC alone moves about 3 billion gallons of fuel in CONUS annually via pipeline. This amount is approximately 45 percent of total DFSC products transported.

The reasons for pipeline popularity are primarily economic. Of the five major modes available to transport liquid petroleum—the others being tanker, barge, rail, and motor—pipelines are by far the cheapest. (They cost 1.5 cents per gallon of fuel moved.)

Economics aside, there are many ancillary benefits that sweeten pipelines' appeal.

They are environmentally acceptable: stable, below ground, with low noise and no emissions. Oil pipeline companies regularly patrol pipeline routes to spot potential problems. Companies also use computers to monitor pipeline operations, detecting irregularities seconds after they occur. Storage tanks are equipped with safety devices to lessen the risk of overflow or fire, and pipes themselves are specially coated to extend their durability. Because of the low likelihood of spillage, there is also reduced chance of loss of life. National statistics indicate that pipelines have a safety record which is unmatched by any other transportation mode.

When Hurricane Gloria thundered along the East Coast on September 26 and 27, people prepared for the bleakest possibilities. Ships in Norfolk, Va., headed out to sea, away from the force of the storm. Many inland areas were also evacuated and there was a strong possibility of rail and road damage. Only one petroleum transportation mode was left unthreatened by the weather: pipelines, buried securely underground, silently pumping fuel regardless of surface conditions.

Although budgetary concerns have heralded economy as the watchword of the Defense Department, pipelines are a sterling example of economy which does not detract from preparedness. While some say that pipelines are susceptible to sabotage, one need only consider that highway and rail service transportation modes could easily be eliminated or suffer long service interruptions if key bridges were damaged or destroyed.

Pipelines are safeguarded by elaborate safety and warning systems. When sabotage does occur, automatic shutdown devices and other system controls prevent large-scale product loss (which could occur in cases of tanker sabotage). Also, pipeline repairs are relatively easy to make. The North Atlantic Treaty Organization's 3,680-mile pipeline has been a target for saboteurs several times, most recently on September 23 when pipeline segments were damaged between Westerburg and Giessen Depot in Germany. Repairs were made by the next day.

Pipelines also make life easier for fuel logisticians who must monitor fuel deliveries at receiving installations. With other transportation methods, fuel officers must sample and measure each shipment individually and separately for quality and quantity. This process can be repeated as many as 30 times a day if tank trucks or tank cars are delivering fuel, and the result is exhaustive quantities of paperwork.

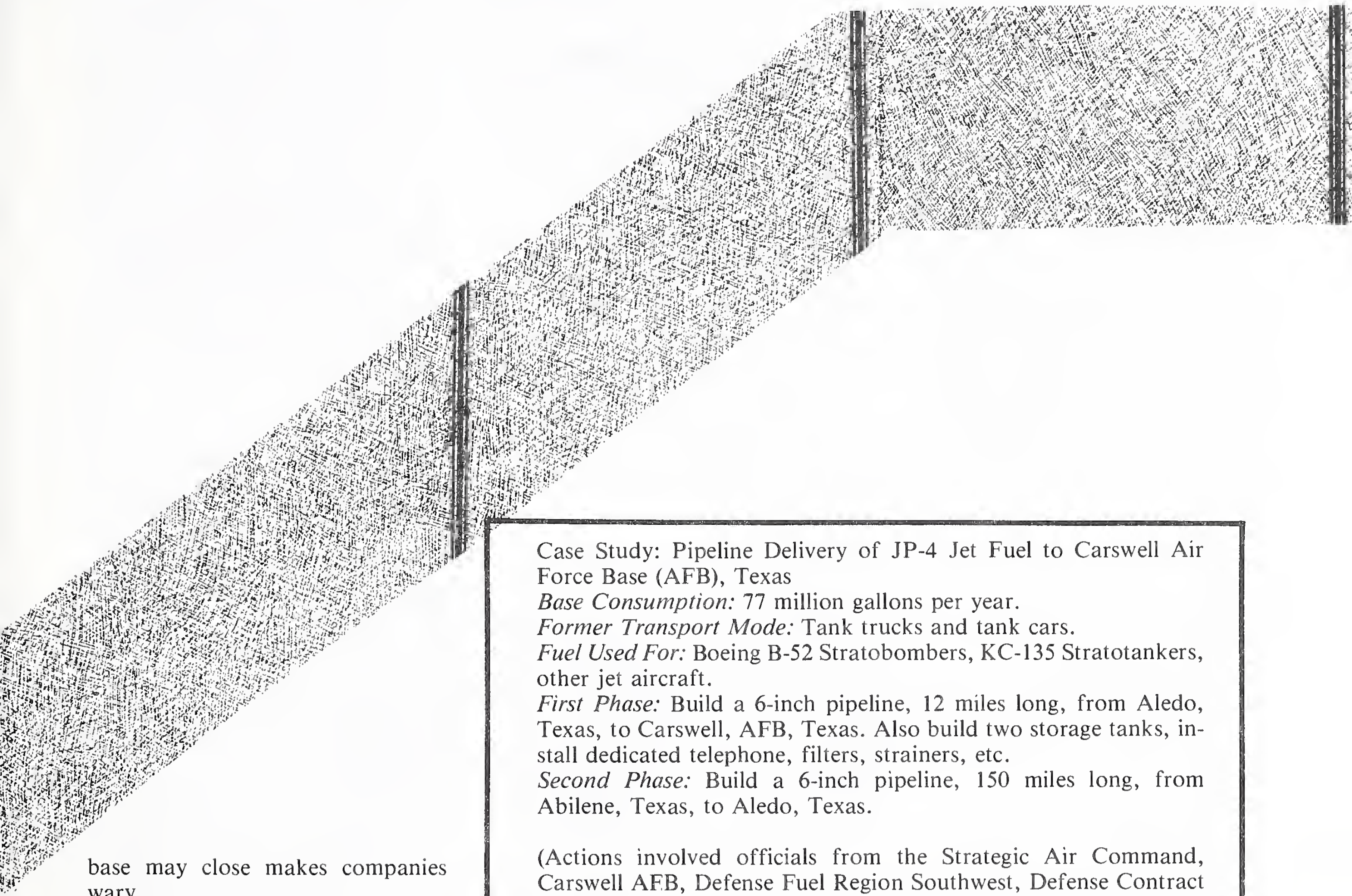
"After pipeline service is established," says Mr. Beatty, "we can just give those same customers a phone call when we are ready to make a pipeline delivery. The fuel officer simply gauges the fuel tank, opens a valve, and monitors the system—which just about operates itself. The use of meters for quality determination reduces paperwork dramatically and further improves quantity determination. Base personnel also avoid irate calls from people who have been delayed due to the heavy volume of fuel trucks or tank cars which contribute to congestion on the base."

Traffic management specialists of the DFSC Transportation Division and DFRs are constantly studying ways to bring DFSC customers into the pipeline network. Once pipeline agreements are established, they need only a few employees to administer them, but obtaining the initial connection involves much coordination and cooperation. The process begins when a using activity, ranked as a priority candidate based on high fuel consumption, proximity to a pipeline, and other factors, is identified by DFSC employees. In the past, using organizations have also requested pipeline service. DFSC appreciates this assistance and actively encourages its customers to suggest improved delivery methods.

A decision to switch to pipeline delivery is made only after an extensive feasibility study. If pipeline service appears economically competitive and advantageous to operations, DFSC, the Military Traffic Management Command, DFRs, the military service involved, and the prospective pipeline company all negotiate. When agreement is reached involving new construction, the contractor must obtain environmental approval to construct and operate the pipeline. (In a 1980 connection made to Edwards AFB, Calif., the initial pipeline route was redesigned to protect three plants on the endangered species list which were growing along the pipeline path. Archaeologists were also consulted to ensure Indian relics along the route were preserved.) The pipeline contractor may have to confer with the Army Corps of Engineers and military service real estate personnel to receive easement privileges for construction on government property.

Construction may also include new storage tanks or the installation of meters, filters, additive injection systems, and dedicated telephone lines.

Even when extensive construction is not required, negotiations for pipeline service may encounter complications. In the past, congressional mandates have led to the closing of several military installations, making some pipeline companies skittish about extending service to other activities. As with any industry, pipeline companies try to protect their investments and the possibility that a newly connected



base may close makes companies wary.

DFSC customers and employees alike agree that pipelines are an extraordinary transportation mode: quiet, efficient, economical, and dependable. But those who monitor petroleum transportation know it will never be the only mode. As in the stock market, the battle cry is "Diversify!" Rail, truck, barge, tanker, and pipeline modes all play an important and unique part in getting fuel to DFSC customers when and where it is needed.

"Even in our enthusiasm for pipeline service, we support a balanced approach to transportation. Each transportation mode has its own virtues, its own time, its own place," says Mr. Beatty. "Saving money is vitally important to DFSC, but we never lose sight of our responsibility to provide the highest level of service to assure positive logistical support." FL

Case Study: Pipeline Delivery of JP-4 Jet Fuel to Carswell Air Force Base (AFB), Texas

Base Consumption: 77 million gallons per year.

Former Transport Mode: Tank trucks and tank cars.

Fuel Used For: Boeing B-52 Stratobombers, KC-135 Stratotankers, other jet aircraft.

First Phase: Build a 6-inch pipeline, 12 miles long, from Aledo, Texas, to Carswell, AFB, Texas. Also build two storage tanks, install dedicated telephone, filters, strainers, etc.

Second Phase: Build a 6-inch pipeline, 150 miles long, from Abilene, Texas, to Aledo, Texas.

(Actions involved officials from the Strategic Air Command, Carswell AFB, Defense Fuel Region Southwest, Defense Contract Administration Services Region Dallas, and Pride Refining.)

Actions	*Target Dates*
Approve Pipeline Delivery	January 1984
Identify Specific Requirements (On-base route, etc.)	February 1984
Begin Easement, Right of Entry	February 1984
Obtain Permits	February 1984
Construct Pipeline/Tankage	June 1984
Coordinate Operating Procedures	June 1984
Test System	15 June 1984

On August 8, 1984, the first shipment of JP-4 jet fuel moved through the pipeline to Carswell AFB.

Military Pipelines:

The Tale of Big Inch, Little Inch, and Pluto

When establishing new pipeline service, it makes good economic sense for DFSC to use commercial rather than government pipelines to transport fuel. Commercial pipelines are usually already constructed, their business is established, and their rates are regulated by federal and state authorities. Furthermore, Uncle Sam need not combat the headaches which accompany ownership: staffing, troubleshooting, maintenance, and repair.

Yet there are times when government pipelines are necessary, whether they are permanent, or hastily constructed to fuel the machinery of troops in combat.

The War Emergency Pipeline, constructed during World War II, was probably the most expansive government-backed system developed for U.S. defense needs. The project spawned the Big Inch system, so-named because the 24-inch diameter of the pipes was twice that of the usual peacetime size, and the Little Big Inch, which had a 20-inch product line. The systems spanned 2,729 miles and were linked to 461 miles of associated large-diameter feeder lines. They included 59 pump stations and transported up to 334,456 barrels of crude oil and 239,844 barrels of refined products daily from Texas to Pennsylvania and New York.

While domestic pipelines transported fuel for some of America's wartime needs, several pipeline systems were quickly constructed overseas to accommodate combat requirements.

In the China-Burma-India theater, a 3,000-mile system was built through rugged mountainous terrain from Calcutta, India, to Chittagong, Bangladesh, and Assam, India, across Burma to China. The fuel was used by General Claire Lee Chennault's Flying Tigers and the Ledo Road supply trucks.

In the Western Hemisphere, the "Canol" pipeline was built to serve the Alaskan highway. The 972-mile system was constructed across subarctic wastes, connecting the Port of Skagway, Alaska, with White Horse, Yukon, Canada.

Four pipelines were also built along the Isthmus of Panama to ensure fuel deliveries could reach this region without tanker traffic causing congestion in the canal area.

Other countries were actively constructing and using pipelines. Certainly the most famous underwater pipeline was that which was laid across the English Channel by the British. Pluto, for "pipeline under the ocean," was used to transport fuel to the continent for the Normandy invasion. Twenty armored, 3-inch diameter cables were installed from the Isle of Wight, England, to Cherbourg, France: they could deliver over 300 tons of gasoline per day. The 30-mile pipes were laid from drums which were floated and towed to unreel the pipes.

Portable (invasion-type) pipelines were initially used in combat in 1941 and 1942. During the drive across France into Germany they were vital. A total of 3,800 miles of prefabricated lines supplied 3,800,000 gallons of gasoline each day for combat troops.

The first pipeline troops were drafted from the oil industry, but other recruits were soon trained in pipeline operations. The Engineer Corps at Camp Claiborne, La., provided pipeline training and also developed lightweight tubing, couplings, portable pumping units, tankage to make military pipelines easy to assemble.

The Army continues to oversee most military pipeline operations, planning, controlling, and maintaining them, but Air Force and Navy activities also manage a fair share of government pipelines.

The trans-Korea pipeline, part of the petroleum distribution system, Korea, is one example of a permanent facility used today by South Korean and U.S. military forces.

PIPELINES: How Many, How Much

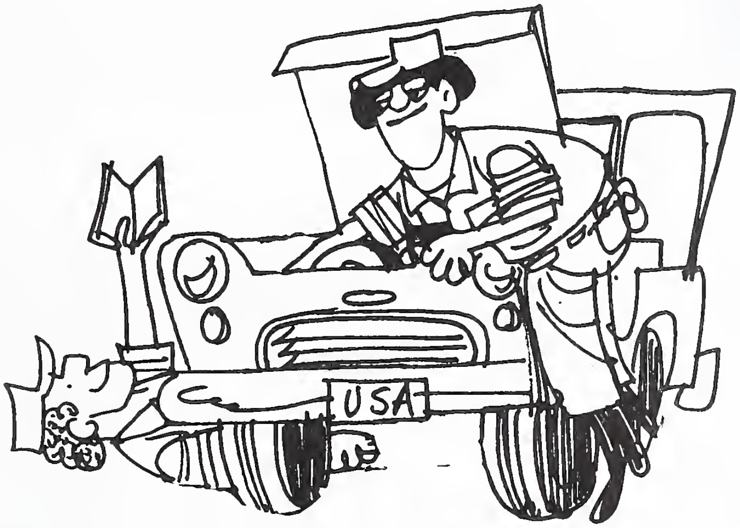
- Percentage of total petroleum products carried in domestic pipelines (1983): 53.7 percent. (In 1972: 40.1 percent)
- Total mileage of oil pipelines: 213,677. (1982)
- Number of U.S. states with pipeline operations: All 50.
- Total transportation fatalities: 47,824. (1984)
- Total of liquid pipeline fatalities: 0. (1984)
- Number of different grades of liquid petroleum pipelines carry: More than 50.
- How long it would take to move liquid products from Houston, Texas, to New York, N.Y., via pipeline: 14 to 22 days. (At 3 to 8 miles per hour, 24 hours a day, 7 days a week.)
- Number of gallons of DFSC fuel moved per year via pipeline: 3 billion.
- Percentage of DFSC-transported fuel moved via pipeline: 45 percent.

With head terminal facilities at Uijongbu, in the north, the system provides fuel for the combined field Army, the 2nd Infantry Division, and other field activities. During Team Spirit 84, last year's joint U.S. military and Republic of Korea training exercise, both ground and aviation forces obtained bulk fuel from the pipeline's Pyongtaek terminal.

Special pipeline units have also been active in Germany, Spain, Okinawa, Korea, and Vietnam.

As is true with all distribution systems, pipelines have distinct advantages and disadvantages during combat. They can carry massive quantities of fuel long distances over terrain which is too rugged for other transportation systems. They can also provide fuel continuously, in spite of weather conditions, and they free transportation vehicles and personnel for other work. In addition to the possibility of sabotage, a prime disadvantage to portable pipelines is that they do not always keep pace with the advance of mechanized forces.

The challenge of the future is to develop and apply technology which will contribute to greater use of pipelines during combat.

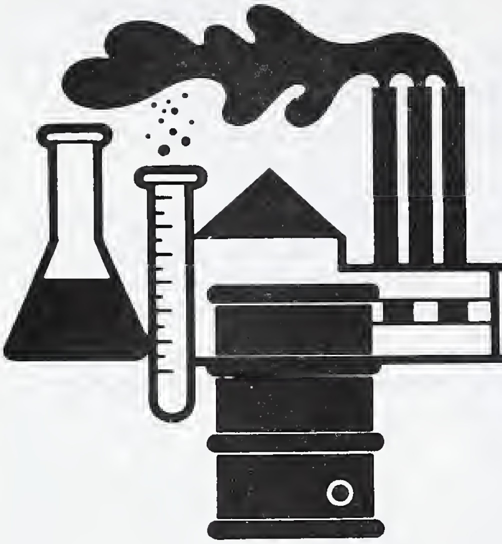


Answers to the safety and health quiz from page 18.

1. *c. Flash point (The temperature at which a liquid gives off a flammable vapor.)*
2. *c. Class C (Because of live electrical equipment.)*
3. *b. False (The cabinet is constructed to provide a 1½-inch insulating air space around it to limit the internal temperature of the cabinet if it were exposed to fire. Removing the vent plug breeches this air space, negating its insulating value. The plugs are provided by manufacturers for a very few locations in the country where local ordinances require venting of the cabinets.)*
4. *c. Shut off fuel*
5. *b. False (Objects should not be inserted into the vapor space until at least 20 minutes has elapsed.)*
6. *b. False (No internal combustion engines, including vehicles, shall be operated within 50 feet of fuel transfers, regardless of the weather.)*
7. *d. All of the above (All are OSHA required.)*
8. *b. False (OSHA requires that all exposed metal parts of cord- or plug-connected equipment which may become energized be grounded. This is to prevent electrical shock and has nothing to do with flammable vapors.)*
9. *b. False (The vapors of JP-4 jet fuel, just like those of gasoline, are heavier than air and may travel great distances along the ground.)*
10. *b. False (Fuels with low flash points, such as gasoline and JP-4 jet fuel, should never be used for cleaning purposes. Ignition sources other than electrical components are a hazard. Use only high-flash-point solvents which are intended for cleaning.)*

Score yourself accordingly:

9-10 correct: Excellent! You've been reading the OSHA manual.
7-8 correct: Good. Probably a former quality assurance representative.
5-6 correct: Fair. Probably a DFSC administrator.
Less than 5: Poor. Read the future *FUEL LINE* safety articles and improve your knowledge of petroleum safety.



FUEL LINE GLEANINGS

SMALL BUSINESS OFFICE ESTABLISHES TOLL FREE NUMBERS

Small and disadvantaged businesses may now reach the DFSC Office of Small Business by calling toll free during regular office hours. The toll free numbers are (800) 468-8893 and (800) 523-2601. These numbers should be used only by those who are seeking advice or information on small and disadvantaged business concerns.

DFSC PROVIDES AID TO FIREFIGHTERS

On July 7, 1985, Defense Fuel Region West responded to an urgent request from the California Air National Guard to fuel C-130 aircraft used for fighting forest fires in Ojai and San Luis Obispo, Calif. Defense Fuel Support Point Norwalk, the normal supply point for the group, provided the fuel within an hour. This response time was unusually rapid as Sunday is not a normal operating day and three tank-truck loads of jet fuel, more than the usual amount, was needed. The firefighters received another 12 tank-truck loads the next weekend. The C-130s contained equipment to spray fire-retardant chemicals.

1985 WISP DISTRIBUTED

The 1985 Worldwide Inventory and Storage Plan (WISP) was mailed to field activities at the beginning of August. The plan is a comprehensive overview of current and projected worldwide inventory and facility requirements. WISP will be used strategically to eliminate war reserve deficiencies and lessen duplicated efforts by the commanders of the military services, the Joint Chiefs of Staff, and the Defense Logistics Agency. The document also details ways to acquire and improve wholesale petroleum storage and distribution services, and serves as a comprehensive Defense Department petroleum plan.

FINAL FY 85 SPR CONTRACT AWARDED

On August 1, 1985, DFSC awarded its final contract for fiscal 1985 Strategic Petroleum Reserve crude oil requirements. One million barrels was awarded to BP Oil International Ltd. for delivery at Hound Point, United Kingdom, in late August. Due to proposed reductions in the fiscal 1986 fill rate, it is believed that no DFSC purchases will be required for this fiscal year. Closings under DFSC's spot solicitation have been suspended indefinitely. The center purchased 39.84 million barrels for fiscal 1985 under 23 separate closings and at a cost of $1.13 billion.

DFSC PROVIDES EMERGENCY FUEL

On August 2, 1985, the General Services Administration requested an emergency procurement of burner oil number 6 for the central plant which provides power for the White House, congressional offices, and other federal buildings. The fuel was needed to supplement a coal unit which was inoperable for about 2 months. DFSC responded with an immediate solicitation to all sources in the Washington metropolitan area. The center received offers and awarded a contract by 4:00 p.m. on August 2. Fuel delivery began on August 4, preventing a potential fuel "run out."

DFSC SUPPORTS EXERCISE SCORPION EXPRESS

DFSC awarded two competitive contracts in August 1985 to support Exercise Scorpion Express, conducted by units from Fort Bliss, Texas, in September and October near Orogrande, N.M. The contracts called for 50,000 gallons of motor gasoline and 210,000 gallons of diesel fuel. The fuel was delivered into bladder tanks from September 9 through October 12.

PIPELINE SERVICE STARTS TO ALTUS AFB

On August 8, 1985, Altus Air Force Base (AFB), Okla., began receiving its JP-4 jet fuel shipments via pipeline rather than tank truck. The 11-mile, 8-inch pipeline extends from Jackson County, Okla., to the base by way of Diamond Shamrock and Marketing Co. Altus AFB consumes an average of 3,000 barrels of jet fuel per day; the new delivery method is safer, more dependable, and more energy efficient, and will save approximately $500,000 a year. Representatives from Diamond Shamrock Co., the Military Airlift Command, Defense Contract Administration Services Region Dallas, and Defense Fuel Region Southwest gathered at the base on August 8 to observe the establishment of the new service.

DFSP HOUSTON RECEIVES PIPELINE SHIPMENTS

On August 17, 1985, Defense Fuel Support Point Houston, Texas, began receiving fuel via pipeline rather than by barge. A total of 65,000 barrels of diesel fuel marine were shipped to the facility via the Coastal Pipeline Co. Total savings for this and other shipments was expected to amount to $35,443 over transportation of the same quantity by barge.

CHANGE IN TRANSPORT TO MCAS BEAUFORT

Because of an August supply source change, Marine Corps Air Station Beaufort, S.C., now receives JP-5 jet fuel by barge from Southland Oil, Savannah, Ga., rather than from Defense Fuel Support Point Charleston, S.C. The Military Traffic Management Command negotiated a 1-year volume agreement which will save $46,788 in transportation rates.

PRESIDENT AVOIDS RAIL STRIKE

At the end of August 1985, President Reagan invoked the National Railway Labor Act to impose a 60-day cooling-off period between the United Transportation Union and the rail industry. The union had rejected arbitration in negotiating a new labor contract. The president also established an emergency board in an attempt to resolve the labor/management dispute. These actions delayed the possibility of a rail strike for at least 60 days, saving DFSC the approximately $13,000 per month that a switch to truck transport would have entailed.

GTP AWARD SAVES $161,075

As a result of a Guaranteed Traffic Program (GTP) award, $161,075 will be saved during the period August 26, 1985, through August

24, 1986, for fuel shipped from Defense Fuel Support Point Cincinnati, Ohio. The fuel will be transported to Naval Air Station Glenview, Ill., the General Electric Co.'s Evandale Plant in Cincinnati, Ohio, and Wright-Patterson Air Force Base, Ohio. The Military Traffic Management Command administers the GTP, which reduces Defense Department transportation costs by soliciting competitive rates from the carrier industry. DFSC Defense Fuel Regions identify delivery patterns and the carrier offering the lowest rate receives the total volume of bulk petroleum to be transported.

GTP SAVES MONEY ON OKLAHOMA SHIPMENTS

A total of $67,226 will be saved as a result of a July award made under the Guaranteed Traffic Program (GTP). The transportation savings will accrue from now until October 1986 for fuel shipped from Standard Transmission Services, Drumright, Okla., to Tinker and Vance Air Force Bases, Okla. The GTP, which is administered by the Military Traffic Management Command, is designed to reduce Defense Department transportation costs by soliciting rates on a competitive basis from the carrier industry.

DFSC REPRESENTATIVE VISITS GERMANY

The chief of the Inventory Management Division in the DFSC Directorate of Supply Operations visited the 200th Theater Army Materiel Management Center, Zweibrücken, Germany, and the European Command Joint Petroleum Office, Stuttgart, Germany, in September. The chief discussed fuel management issues, including resupply timing, resupply methods, and levels management, in the European Theater in order to continue effective peacetime and wartime support.

OPDS VIEWED IN VIRGINIA

DFSC and Military Sealift Command representatives visited Cape Charles, Va., on September 16 to observe the prototype demonstration of the offshore petroleum discharge system. The system can provide 1.2 million gallons of refined petroleum products a day to the beach from a tanker moored 4 miles offshore. It is intended for use in areas where there are no port facilities or where existing facilities are not usable.

INTERMODAL CONTAINERS USED IN PUERTO RICO AND CUBA

Defense Fuel Region Southeast (DFR-SE) has improved the supply of aviation gasoline to Roosevelt Roads, Puerto Rico, and Guantanamo Bay, Cuba, by loading intermodal containers at Defense Fuel Support Point Lynn Haven, Fla., for direct shipment to these destinations. Since March 1985, the fuel had been shipped from Lynn Haven via tank truck to Jacksonville, Fla., where it was transferred to intermodal tank trailers provided by Trailer Marine Transport Inc. (TMT). DFR-SE transportation personnel, concerned over the lack of quality surveillance during that final procedure, arranged for negotiations among the Military Traffic Management Command, the Military Sealift Command, and TMT which resulted in the new loading procedure. The first containers were inspected, loaded, and sealed on August 23 for direct shipment to their destinations.

NINE SCHOOLS WILL STUDY EOR

Twelve enhanced oil recovery research projects proposed by nine universities will provide much of the government's basic petroleum research program for the next 5 years. Each examines the technology to squeeze additional oil from reservoirs where conventional production methods are no longer effective.

The projects could receive up to $200,000 each for initial 1-year efforts that would begin a new series of fundamental, petroleum-related research. The Energy Department has allocated $1.7 million for the 12 projects in fiscal 1985.

"The petroleum research conducted in our nation's academic laboratories has been extremely helpful in improving the understanding of our large domestic residual oil resource," said Energy Secretary John D. Herrington. "There is a continuing need for this type of high-risk, long-term basic research on advanced and innovative petroleum technology."

Trapped Reservoir

More than 300 billion barrels of oil remain trapped underground in the United States, beyond the grasp of current technology.

The selected projects were submitted by the Illinois Institutes of Technology, Columbia University, University of Texas, New Mexico Institute of Mining and Technology, University of Oklahoma, Hardin-Simmons University, University of Minnesota, University of Kansas, and University of Southern Mississippi.

Results of the research will be published by the department and made available to the public.

SPR "NO POWER" DRAWDOWN

Some 375,000 barrels of crude oil were moved out of the Strategic Petroleum Reserve using conventional diesel-fueled pumps in a test to demonstrate a drawdown without electricity. Fresh water was forced into a 10-million barrel cavern at the Bayou Choctaw site in Louisiana, forcing oil up and out of the cavern and down the pipeline to the St. James Terminal 37 miles away.

Technical Directorate Hosts Annual Technical Meeting

by Dr. George Mattamal

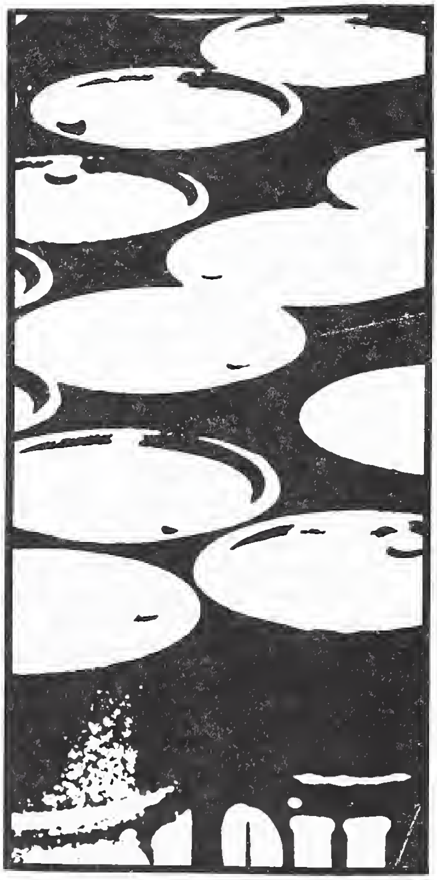
On September 24 and 25, some 35 representatives of Defense Department organizations attended the Annual Petroleum Technical Meeting hosted by the DFSC Directorate of Technical Operations (DFSC-T). The conference was held at Cameron Station, Alexandria, Va. Among the organizations represented were the Naval Air Systems Command, Navy Petroleum Office, 200th Theater Army Materiel Management Command, San Antonio Air Logistics Center, Naval Sea Systems Command, U.S. Army Belvoir Research and Development Center, Naval Research Laboratory, and U.S. Army General Materiel and Petroleum Activity.

The DFSC Commander, Brigadier General John E. Griffith, U.S. Air Force, opened the conference with his pledge of support for resolving scientific and technical problems with existing and future fuels. Calvin J. Martin, DFSC-T director, chaired the meeting and discussed quality functions with an overview of the Defense Logistics Agency reorganization.

DFSC employees and other conference attendees gave briefings and conducted discussions. Topics of particular interest included diesel fuel stability, tanker coating problems, and the emphasis on reducing fuel waivers and deviations to improve product quality.

Immediately following the technical meeting many of the participants convened to discuss the final draft of the *Quality Surveillance Handbook for Fuels and Lubricants* revision (MIL-HDBK 200 G), which will be published prior to the end of 1985.

Dr. George J. Mattamal joined the Directorate of Technical Operations in February 1985 as a chemist. He has served as a chemistry professor at the College of Notre Dame, Baltimore, Md., and as an academic liaison/research scientist with the National Bureau of Standards. He was selected as a Commerce Science Technology Fellow for 1982-1983, and worked at the Department of State's Bureau of Oceans and International Environmental and Scientific Affairs. He holds a bachelor's degree in chemistry from American University, Washington, D.C.



PERSONNEL NOTES

Commander Nelson and his Defense Fuel Region staff.

DLA NAMES COMMANDER NELSON AS ONE OF TOP 10

The Defense Logistics Agency selected former DFSC employee Commander Ronald C. Nelson, Supply Corps, U.S. Navy, as one of 10 outstanding employees of the year from a workforce of almost 50,000.

During the 1984 award period, he commanded Defense Fuel Region Caribbean (DFR-CR), located at Homestead Air Force Base, Fla. He and his staff were responsible for the acquisition, quality assurance, and integrated material management of petroleum products procured by DFSC in the Caribbean and Central and South America. He also oversaw the region's acquisition of crude oil for the Department of Energy's Strategic Petroleum Reserve (SPR).

The award period was marked by a number of challenges for DFR-CR personnel. Commander Nelson adapted limited staff resources to deal with the region's ever increasing contract workload. Lift requirements for crude oil and refined product doubled during the year, exceeding $1.2 billion in value. To accommodate the workload, the region established field residencies in Venezuela, Mexico, and St. Croix. Quality and quantity controls were formulated with contractors and officials of national refineries. These new facilities have already provided over a billion gallons of fuel for the Defense Department.

Concurrently, Commander Nelson and his staff developed documentation and loss control programs which have reaped tens of millions of dollars in benefits for the U.S. government through the reduction of tanker demurrage claims and the smallest SPR cargo loss rate ever experienced in that program's procurement history.

In Honduras and El Salvador he managed the development of petroleum supply and quality assurance programs to support U.S. and host country forces participating in exercises and training operations. This work involved massive refinement of primitive fuel production and distribution modes. Once supply programs were in place, DFR-CR personnel were involved in grueling follow-up work at remote and often dangerous field sites. At the time of the award nomination, the Honduras and El Salvador programs had already supplied 30 million gallons of fuel.

During Commander Nelson's tenure at DFR-CR, the region received the Department of Defense Joint Meritorious Unit Award.

Commander Nelson now serves as deputy director for contract management at Defense Contract Administration Services Region Chicago, Ill. FL

WILLIAM UNGER RECIPIENT OF SPECIAL ACHIEVEMENT AWARD

Colonel Robert R. Bachmann, U.S. Army, commander of Defense Fuel Region Europe, recently presented a Special Achievement Award to William N. Unger. Mr. Unger is chief of the Defense Fuel Quality Assurance Residency High Wycombe, United Kingdom.

During the October 1984 through March 1985 award period, Mr. Unger resolved several fuel quality problems with shipments deter-

mined to be off-specification on thermal stability and filtration times. He isolated the product to the best extent possible and directed filtering and blending operations. These actions successfully brought all the fuel back to specification.

Colonel Bachmann noted that Mr. Unger had proven his superior handling knowledge several times before, most notably during the Falklands conflict in 1982. At that time, he was dispatched from the United Kingdom to Ascension Island to advise the Royal Air Force and Army on the disposition of Defense Logistics Agency-owned fuel. He was later cited by the assistant secretary of defense for these efforts. FL

MR. BRADSHAW EARNS MCS AWARD

DFSC employee Samuel M. Bradshaw, currently chief of the Systems and Procedures Division, Office of Telecommunications and Information Systems, recently received the Meritorious Civilian Service Award. The award was based on his 10 years of service as chief of the Management Information and Analysis Division in the DFSC Office of the Comptroller.

Under Mr. Bradshaw's supervision, this division maintained a data base on all DFSC program objectives, developed a review process to measure the center's actual performance against its objectives, and analyzed reasons for any deviations from these milestones.

His award credited Mr. Bradshaw with "significant improvements in the center's information collection and reporting process, reports management program, and claims collection procedures." He was also cited for "extensive knowledge of fuels logistics . . . and a unique ability to challenge and resolve complex problems."

His work with the Defense Energy Information System (DEIS) was one example of his accomplishments in the decade-long award period. DEIS is an Office of the Secretary of Defense (OSD) report which tracks inventory and consumption of bulk petroleum products and such utility fuels as electricity, natural gas, and steam. The report was begun during the 1973 fuel shortage. Throughout the years, Mr. Bradshaw made refinements in and revisions to the original DEIS in order to keep the report useful for OSD and the military services. He was instrumental, for example, in developing editing criteria to ensure data were reported accurately. As a result, DEIS users now have greater confidence in the information's accuracy and consider these reports a useful tool for managing Defense Department energy consumption.

Mr. Bradshaw was also the center's trailblazer for demurrage collection (the dollar charge levied against a contractor for delaying a tanker or barge beyond the time allowed for loading or unloading). In 1976, despite having no previous experience in demurrage claims, Mr. Bradshaw worked closely with his staff and collected $1.5 million in back claims. Prior to 1976, claim collections amounted to less than $500,000 per year. In the following 7 years, another $13.2 million in charges was deposited in the U.S. Treasury.

Mr. Bradshaw began his federal service in 1955 as a warehouse helper at Gentile Air Force Station in Dayton, Ohio. He joined DFSC in 1973. FL

JOYCE WHEELER RECEIVES FWP AWARD

Joyce A. Wheeler, secretary to the DFSC Director of Technical Operations, received a Defense Logistics Agency (DLA) Federal Women's Program Award on October 1, 1985. Mrs. Wheeler, who has been a DLA employee for a total of 8 years, was selected for the award based on her work-related accomplishments within the Technical Directorate and her service as a role model for others.

In addition to her usual office duties, Mrs. Wheeler is credited with assuming much of the work of the directorate's Systems and Programs Office. This authorized (but as yet unstaffed) office handles DLA and DFSC policies and procedures, award and suggestion programs, the directorate's budget, travel orders, and personnel actions.

Mrs. Wheeler was also saluted for training a stream of directorate clerk-typists and secretaries on DFSC procedures and regulations and advising them on career opportunities and goals. As a result, many of these employees have been promoted, frequently cross-training into other career fields. FL

DON PESCHKA RECEIVES SPECIAL ACT AWARD

Donald E. Peschka, currently chief of the Management Information and Analysis Division in the DFSC Office of the Comptroller, received a Special Act Award for work on a 5-year fuel support agreement with the government of Egypt. During the May 1985 award period, Mr. Peschka was serving as a contract specialist in the Bulk Fuels Division of the Directorate of Contracting and Production.

He and other DFSC team members (William S. Zanca, of the Office of Counsel, and Navy Commander George R. Boyt, Supply Corps, chief of the Plans and Programs Division in the Office of Planning and Management) traveled to Egypt to negotiate with several representatives of the Egyptian government, including members of their Ministry of Defense, Armed Forces Department, Air Force, Army Fuels Department, and National Services Projects Office. Despite severe language barriers and complex negotiations, a fuel support agreement was arranged that resulted in overall cost savings of $780,000 to the U.S. government.

During the same period, Mr. Peschka and other members of the DFSC negotiating team met with American embassy personnel in Cairo and with the commercial into-plane contractor for Cairo Airport as well as with representatives of the commander in chief, Central Command, and with the Air Force component of the Central Command. The coordination of U.S. requirements with all parties to the memorandum of understanding required "talent in negotiation and diplomacy as well as patience." FL

JOYCE GUTOWSKI EMOND

On October 19, 1985, Joyce Gutowski Emond, 38, died as a result of a traffic accident near her home in Stafford, Va. Mrs. Emond was a budget analyst in the DFSC Office of the Comptroller.

She is survived by her husband, William Emond; three daughters, Cassandra, Christine, and Tonya; a son, Adam; her mother, Mrs. Mary Gutowski; and two brothers, Steven and David Gutowski.

Mrs. Emond was born in Washington, D.C. She began her federal government career as a clerk/stenographer with the Department of the Army in September 1967 at Fort Belvoir, Va. In February 1968 she became an accounting technician for the Department of the Navy at Quantico, Va. She transferred to the Defense Logistics Agency Administrative Support Center in May 1973 as a voucher examiner. In September 1974 she joined the DFSC Office of the Comptroller.

She was a member of St. William of York Catholic Church and of the Civil War Reenactment—47 Virginia.

In Memory Of

Lieutenant Colonel James M. Fichtner, U.S. Army

Army Lieutenant Colonel James M. Fichtner, who served as commander of Defense Fuel Region Central (DFR-C) in St. Louis, Mo., for a short time last year, died of cancer on July 19, 1985. Survivors include his wife Heidi, and daughter, Jennifer.

Lieutenant Colonel Fichtner took command of the region at the end of May 1984; his illness necessitated his transfer to a medical holding company in July 1984.

Born in Emporia, Kan., on June 3, 1944, Lieutenant Colonel Fichtner earned a bachelor's degree in business administration from Campbell University and a master's degree from Boston University. His military education included courses at the Army Quartermaster School, Fort Lee, Va., and the Command and General Staff College.

His military service began with his enlistment in 1964, after which he was assigned to the Army Security Agency. In 1966, following graduation from Officer Candidate School at Fort Lee, Va., he helped activate the 559th General Supply Company and deployed with it to Vietnam. He also served as company and depot commander of a petroleum depot company and as a 1st Infantry Division petroleum officer in Vietnam, as a 1st Support Brigade petroleum officer in Germany, and as a logistics advisor to the 96th Army Command. Lieutenant Colonel Fichtner then served as the senior petroleum officer for the Deputy Chief of Staff for Logistics Petroleum Office, U.S. Army Europe.

Before his assignment to DFR-C, he was chief of the Advance Petroleum Logistics Division and chief of the Course Development Division at the U.S. Army Quartermaster School, Fort Lee, Va.

Dennis Edwards, acting commander of DFR-C, noted, "He was a stubbornly loyal man who in his 18 years of service never forgot the credo: Duty, Honor, Country. These were words of substance and meaning for him—and had he had his way, he would gladly have remained in command until the very end. One of our greatest regrets here at Central is that he could not complete his tour with us so we could benefit from his professionalism. He was a soldier, officer, husband, father, and friend—roles he was comfortable with, and ones which he fulfilled in a selfless and caring way that those of us who knew him will never forget."FL

Robert P. James Receives Distinguished Career Service Award Posthumously

On October 25, 1985, Mrs. Carol James accepted the Defense Logistics Agency Distinguished Career Service Award on behalf of her late husband, Robert P. James, who died on June 26, 1984. Mr. James was the chief of the former lubricants and specialty products division.

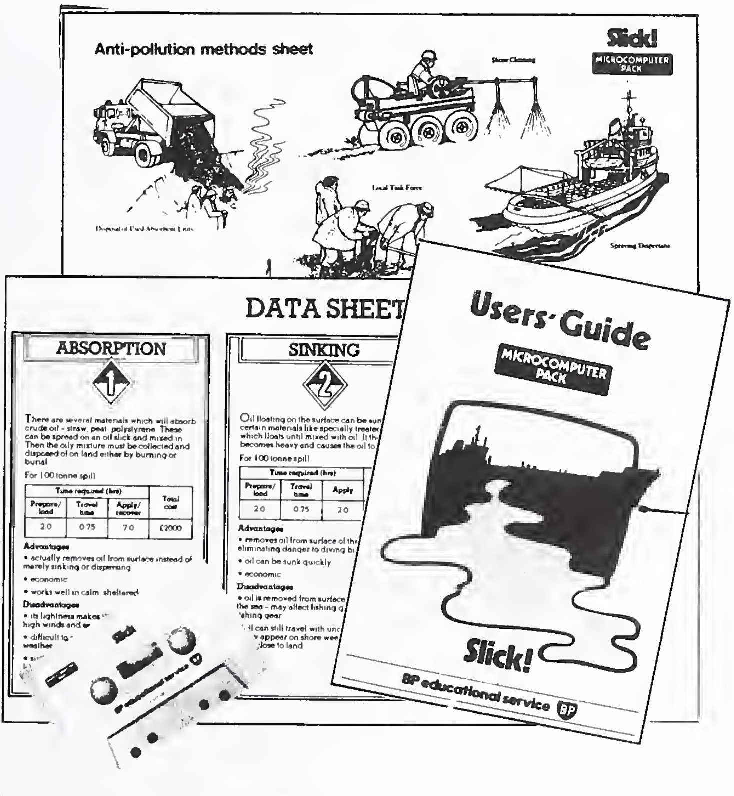
The DFSC Commander, Brigadier General John E. Griffith, U.S. Air Force, presented the award, which was based on service at DFSC beginning on December 26, 1963. The award cited Mr. James for his "long career of achievement and promise" and noted: "His legacy of accomplishment serves as an inspiration for those of us who remain."

Mr. James began his career as a clerk-typist and rose steadily through the ranks, serving as a procurement assistant, procurement agent, supervisor, and contracting officer until he became chief of the lubricants and specialty products division in May 1980. In 1983, under the guidance of Mr. James, all of the major functions of the division, except acquisition of bulk lubricants, were transferred to the Defense General Supply Center (DGSC) in Richmond, Va. Brigadier General John A. Corder, U.S. Air Force, Commander of DGSC, writing to express his appreciation for the smooth transfer of responsibilities, commented that "none of this would have been possible without the dedicated, professional, and enthusiastic support of Mr. James."

During his 22 years with DFSC, Robert James earned five outstanding performance awards, a certificate of achievement, a letter of recognition, two quality salary increases, and 15 letters of appreciation.

He earned high praise from representatives of private industry for his technical knowledge and logistical expertise in the fields of lubricants and packaged petroleum products. Within the defense petroleum community he was recognized as a team player capable of solving complex problems of stock availability, product standardization, and customer service.

In addition to his wife, Carol, who is a DFSC employee, Mr. James is survived by his son, Bill.



OIL INDUSTRY FEATURED IN COMPUTER GAMES

Computer business games designed to teach students aspects of economics and environmental protection have been developed by the United Kingdom oil giant, British Petroleum, through its BP Educational Service division. They have been an instant success in the highly computerized British school system. One, *The Paraffin File,* has three paraffin (kerosene) companies competing for sales in a climate of rising prices and a declining market. Decisions have to be made on price, advertising, staff numbers, and market research. The computer generates financial reports as the game-years roll by. Graphical analysis is provided. In *Slick!,* for students aged 10 to 16, the problem is to deal with an oil spill threatening an environmentally sensitive coastline. It brings together awareness of the impact of technology on society, investigation of methods available to combat oil pollution, and an introduction to decisionmaking and working in groups. For further information, write to: BP Educational Service, P.O. Box 5, Wetherby, West Yorkshire, LS23 7EH, United Kingdom.

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FLARE

Another Star on the Horizon

As this edition of the *FUEL LINE* was going to press, it was learned that President Reagan has approved and intends to nominate the DFSC Commander, Brigadier General John E. Griffith, U.S. Air Force, to the Senate for appointment to the grade of major general. Brigadier General Griffith assumed command of DFSC in May 1985. He was promoted to Brigadier General on August 1, 1981, with the same date of rank.

The *FUEL LINE* staff joins in with other DFSC employees in congratulating General Griffith and extending best wishes for his continued success.

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